MORE COMPONENTS

Individual solutions bring greater cost efficiency
ADDED VALUE

With more expertise for the perfect multi-component solution.
Multi-component injection moulding: we have a lot to offer you in this regard - as a technological pioneer with around 60 years of experience! From small to large, from hydraulic and electric to vertical, with a wide variety of configuration options, not just for our injection units - that’s how far our range extends. That’s what really counts! For us. And in your production.

WIR SIND DA.
We have been successfully involved in the production of multi-component moulded parts since as early as 1962. Our extensive knowledge of application technology already benefits you in several ways: as machine concepts that are perfectly tailored to your requirements, but also as well-founded consulting services. Thus, working with ARBURG also means higher process reliability and quality during multi-component injection moulding. For maximum production efficiency.

AT A GLANCE

Everything possible in terms of process engineering: we are not limited any particular concept when it comes to finding the best solution for you.

Highlights

• Hydraulic, electric and vertical machines
• Fully integrated mould technology
• Automation and complete turnkey systems
**Perfectly harmonised technology**

Based on standard solutions for processing several components, machine technology from ARBURG can always be adapted precisely to the relevant injection moulding task:

- Wide selection of series, sizes and injection units
- Flexible arrangement of the injection units, just as the mould or process requires
- Numerous equipment and configuration options, as with silicone processing

**Reliable process control**

Even sophisticated injection moulding processes always remain clear thanks to our outstanding control technology. Graphic sequence programming makes the co-ordination of several injection units and mould functions and the integration of peripheral equipment easy to understand and clear at all times. Numerous functions for process optimisation, monitoring and documentation ensure top quality moulded part production.

**Utilising unique know-how**

Our application technicians can provide all-round competent consulting – across all process versions. Any questions about the relevant machine and process technology?Need help with moulded part design and mould design? These are things that we take for granted. Alternatives are always conceivable thanks to our modular product range and are also explicitly included in the overall evaluation of the best technology concepts.

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**MULTI-COMPONENT EQUIPMENT**

- Flexible arrangement of independent injection units
- Near-mould core pull connections
- Reproducible, position-regulated injection (servo-electric or via hydraulic accumulator)
- Accessories such as interval, rotation or index units
- Special cylinder modules, for example for marbling or for silicone processing
- Central control of all injection units and mould and robotic sequences

- Standard
- Optional
THE PROCESS: VERSATILE

Need to implement special design solutions? Want to optimise product properties in a targeted approach? Looking to integrate functional elements? The combination of different materials and colours in a single moulded part can produce interesting options. There is a wide range of process techniques available for this that differ in the way in which the components are combined. Fully automated production without additional assembly steps or reworking minimises unit costs. Your profitability rises as the number of units produced increases.

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>PROCESSES</th>
<th>Addition of second component</th>
</tr>
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<tr>
<td>One sprue system</td>
<td>Interval injection moulding</td>
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<td></td>
<td>Sandwich injection moulding</td>
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<td></td>
<td>Marbling</td>
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<tr>
<td>Multiple sprue systems</td>
<td>Core-back process</td>
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<tr>
<td></td>
<td>Turning stack mould technology</td>
<td>–</td>
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<tr>
<td></td>
<td>Rotation technology - mould half</td>
<td>–</td>
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<tr>
<td></td>
<td>Rotation technology - mould platen</td>
<td>–</td>
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<tr>
<td></td>
<td>Rotation technology - mould insert</td>
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<tr>
<td></td>
<td>Transfer technology</td>
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**Sandwich injection moulding**

Functional core with an attractive looking/feeling exterior: Sandwich structures can be achieved with single-component moulds through an orderly injection sequence involving two injection units. The typical three-layer structure is achieved with the aid of an interval unit as an accessory. Independent injection units are required in order to be able to work simultaneously and inject in a programmable sequence.

**Interval injection moulding**

This process enables coloured surface effects to be reproduced through targeted timing control of two injection units. There is no clear colour boundary between the components. As in sandwich injection moulding, you can use cost-effective, single-component moulds. In order to link the two injection units, an interval unit is required as an accessory.
Marbling

During marbling, coloured surface effects are achieved by inhomogeneous mixing of several plastics in one injection unit. Consequently, there is no clear colour boundary and the colour effects are not reproducible. ARBURG supplies a special cylinder module with a piston injection unit for marbling. A mixing section provides the required colour mixture.

Core-back process

In the core-back process, the cavity is extended by pulling a slide, enabling a second component to be injected. The sequential cycle is especially suitable for moulded parts with simple geometries. As well as involving less complex tool technology without further transport of the pre-moulded part, this process also offers you a large number of cavities per mounting surface.
Stack-turning mould technology

A large number of cavities with a small clamping area and low locking forces: using stack moulds, pre-moulded part and finished moulded parts can be produced simultaneously in parting lines positioned one in front of the other. As well as two-station moulds, cube moulds with four stations are also used. These also have the advantage that additional process steps, such as insertion, testing or removal can be integrated without increasing the cycle time. Based on a specially designed ALLROUNDER CUBE mould, ARBURG can implement tailor-made complete solutions for you.

Further information:
Packaging brochure
Highly flexible operation: Rotation and transfer technology are also ideal for hard/soft combinations.
Rotation technology
The pre-moulded parts are transferred to the second station via a horizontal rotary movement. They remain in the part of the mould that is rotated and are not demoulded. Internal or external mould rotary devices are required as accessories for this purpose. A distinction is made between rotation of a mould half, a platen or an insert. Our consistently high-quality multi-component technology also enables you to fully exploit the potential of the process:
- Simultaneous injection moulding facilitates short cycle times
- Four positions/components and more possible

Transfer technology
With this process, the transfer of pre-moulded parts to the second station via a robotic system takes place directly in the mould, or in a second machine. Preform and finished moulded parts are also produced simultaneously in this process. This leads to short cycle times. However, the transfer technology offers you even more interesting advantages:
- Simple mould technology
- Thermally separate mould areas can be implemented
- Robotic systems can be used for further upstream and downstream production steps
- Production steps can be integrated in the pre-moulded part
- Ideal for bulky inserts

Assembly injection moulding
This includes all processes with transfer, rotation or stack-turning mould technology in which assembly steps are integrated directly in the injection moulding process. Assembly takes place either in the mould following injection, or two incompatible components are combined without a positive material bond using the injection moulding process. This procedure offers a great deal of added value:
- The finished product is created in a single step
- No downstream joining or assembly - fewer parts
- Fully functional products with moving elements
Opting for our multi-component injection moulding technology allows you to draw on an extensive standard range of technology which leaves nothing to be desired in terms of configuration options. You are bound to find the right machine and equipment for your specific part requirements within this broad range. Our offering is completed by comprehensive application technology consulting and project planning. All from a competent source: from technology and system partner ARBURG.
**Fully hydraulic to fully electric**

Thanks to hydraulic accumulator technology on the ALLROUNDER S or servo-electric drives in the A series, the axes of motion and thus also the injection units operate completely independently of each other. Reproducible mould filling and high moulded part quality are achieved through position-regulated screws as standard.

**Wide variety of combinations**

The cylinder modules are compatible with all series and are finely graded. Various versions ensure optimum protection against wear. In addition, screws in special geometries allow you to process all common plastics. Electric ejectors and core pulls are available as well as hydraulic ones for the clamping units.

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**MULTI-COMPONENT ALLROUNDER**

Distance between tie bars: 270 - 920 mm

Clamping forces: 400 - 5,000 kN

Injection units: 30 - 4600
The alternative: Vertical machines

Our wide product range of machines for multi-component processing is supplemented by vertical and rotary table machines for overmoulding inserts. This means you are not limited any particular concept when it comes to finding the best solution. In addition to mould and process technology, we also consider aspects such as cost-effectiveness, automation and cycle times.

Further information:
Products and services brochure
The classic: horizontal and vertical

The horizontal-vertical arrangement of the injection units fulfils the majority of requirements with regard to multi-component technology. Practical equipment details, such as manually displaceable vertical injection units, effectively shorten set-up times. The installation space and opening stroke of the clamping units are also suitable for large moulds. Extended tie-bars are available as an option.

Flexible configuration

Several different positions of the injection units are possible with respect to one another. These can be flexibly arranged precisely in line with mould and process technology requirements. Solutions with up to six components have already been implemented. What this means for you is that individual, customised multi-component machine technology is available to suit every application.

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
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<tbody>
<tr>
<td>Injection in the mould parting line</td>
<td>V</td>
</tr>
<tr>
<td>Small footprint</td>
<td>L P W M</td>
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<tr>
<td>Low ceiling height</td>
<td>−</td>
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<tr>
<td>Good accessibility to the mould</td>
<td>−</td>
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<tr>
<td>Good accessibility for robotic system</td>
<td>−</td>
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<tr>
<td>Can be used as a single-component machine</td>
<td>−</td>
</tr>
<tr>
<td>Suitable for large injection units</td>
<td>−</td>
</tr>
<tr>
<td>Suitable for large machines</td>
<td>−</td>
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</tbody>
</table>
W position: second injection unit positioned at 45° angle above the horizontal unit.

L position: second injection unit horizontal on the back of the machine.

P position: second injection unit horizontal and parallel to the first.

V position: vertical arrangement of the second injection unit above the mould.

M position: second moving injection unit is mounted above the moving mounting platen.
Further information:
Robotic systems brochure
Rotary units
Our rotary units are attached to the moving mounting platen. This makes them suitable for various moulds and easy to retrofit. Depending on the machine type and size, you can choose between hydraulic or servo-electric drives.

Indexing units
As an alternative, we can offer you servo-electric index units to rotate mould platens or inserts. These are integrated in the moving mounting platen and are ideally suited for large opening strokes.

Robotic systems
Complete solution with an ALLROUNDER: Our versatile robotic technology can be precisely adapted to your particular handling task. These are also ideal conditions for the multi-component injection moulding, for example of hard/soft combinations.

Interval units
Our interval unit allows a horizontal and a vertical injection unit to be connected. It is attached to the fixed mounting platen and can therefore be utilised universally for a number of different moulds. We achieve high process reliability as the melt flows are thermally coupled until immediately upstream of the sprue system.

Compatible with multi-component technology: linear robotic systems positioned above the moving mounting platen.

Servo-electric rotary and index units enable up to 2.3 s shorter rotation times
 Complex requirements can be handled with ease! Maintaining control over sophisticated machine, robotic and peripheral technology requires a correspondingly powerful control system. The clearly laid out graphic sequence programming enables all steps within the production cycle to be performed intuitively. All the features of our SELOGICA control system are designed for a fast, secure and comfortable set-up and operating process. This enables you to get the best out of all your applications.

**Highlights**

- Free sequence programming with graphic symbols
- Direct plausibility checks
- Various assistance packages
- Control centre for the entire injection moulding technology

CONTROL SYSTEM: SMART

Nothing is impossible: multiple functions for specialised technology, with which even special sequences become standard for you.

One for all: fully compatible, consistent use of the same operating philosophy means less training and set-up effort.

Further information:
user interfaces brochure
**Integrated functions**

Maximum flexibility during set-up and high process reliability: mould and robotic functions are fully integrated in the machine control system. All movements can be perfectly coordinated and comprehensively synchronised. This is assured by individual starting conditions, for example. Start-up and emptying cycles with multi-station moulds can be programmed with ease. This is also possible in combination with robotic systems or when not all injection units are in use.

**Central user interface**

Our machine control gives you direct access to all injection units. For example, in the freely configurable process graphics, the injection parameters can also be compared with one another in detail. Complex sequences are made transparent and comprehensive process optimisation and documentation are ensured. For quality assurance purposes, the parts status is communicated from station to station. Additional benefit: There is only one data record for the entire production unit, including accessories, such as rotary units or robotic systems.
APPLICATIONS: IN PRACTICE

From colour-coded toothbrushes, integrated soft-touch function for keypads or movable joints in action figures: multi-component technology allows you to produce functional products efficiently in a single cycle. When it comes to implementing your innovative production and product ideas, we are always the ideal technology and system partner! We can offer you machines and turnkey solutions precisely tailored to the individual case in hand. Professional advice, from the planning stage and installation on site through to service. Your all-round carefree package from ARBURG!

Efficient mould concept: Injection moulding process and parts handling run simultaneously.

High process reliability: robot and mould processes programmed by a machine controller.
Control for automobile interior: stability, feel and functionality in a single step.

Functionally integrated: index unit turns out pre-moulded parts for dentures.

Fast and precise: the cavities of a multi-component mould are rotated by 120°.

Individual turnkey solution: work-piece carrier circulation system connects two ALLROUNDERS.

Further information: turnkey projects brochure