



THERMOSET PROCESSING

Technology and know-how
for integrated solutions

ARBURG

A TOUGH CASE

**Special injection moulding
technology for special plastics.**

Resilient, abrasion-resistant, heat-resistant, electrically insulating, resistant to chemicals. These are just some of the interesting properties of thermosets. Precisely adapted processing is required for the smooth production of materials for „tough cases“. It is therefore an advantage when technology and expertise come from a single source, as is the case with ARBURG.

WIR SIND DA.



Customised: Support and configuration of the ALLROUNDERS to suit the application

AT A GLANCE

// Whether used in an automotive clutch piston, in a housing for electronic components or as an insulating strip in domestic irons, thanks to their special properties, granular thermosets and moist polyesters have a wide range of applications. Our reliable hydraulic and vertical ALLROUNDERS provide the ideal basis for the reproducible processing of these materials. As well as our practical additional equipment, we can offer you exactly the production solution that you would expect from us: The right one! //

Highlights

- INJESTER tamping devices for feeding moist polyester
- Fully integrated peripheral equipment and mould technology
- Automation and complete turnkey systems

Precisely adapt technology

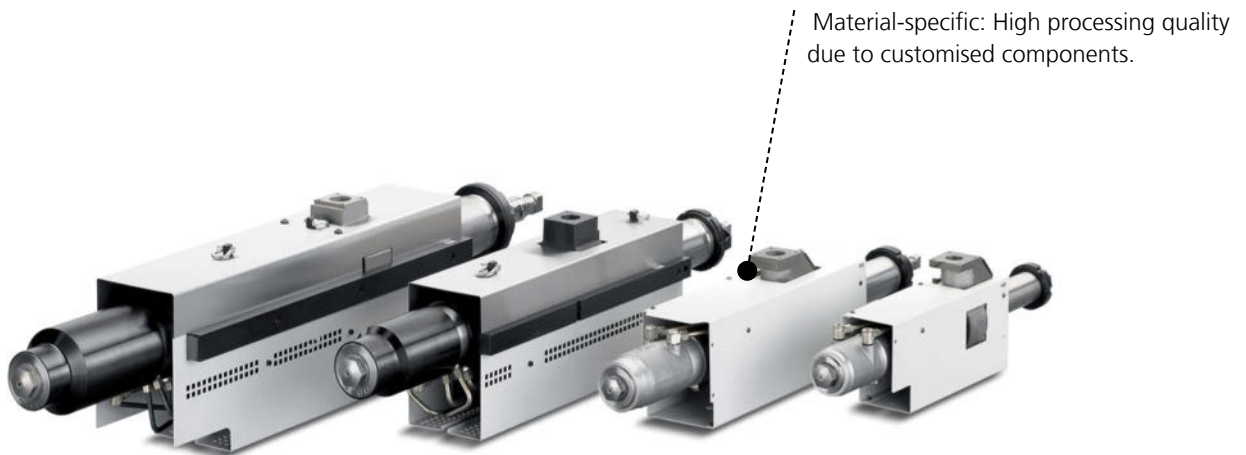
Fibre-friendly, material-friendly processing and precise moulding: The combination of a hydraulic or vertical ALLROUNDER with our specific thermoset package is designed as a system solution. A large selection of sizes with flexible equipment and configuration options means that the machines can be adapted precisely to your particular injection moulding task.

Easy implementation of sequences

Our machine control system easily integrates process-specific peripherals equipment. Thanks to process programming with real-time plausibility check, even complex processes can be set up with ease. Numerous functions for process optimisation, monitoring and documentation ensure top quality moulded part production. These include adaptive mould heating circuits, injection compression moulding or venting.

Exploiting sound knowledge

What drives us? Finding the most economical solution for you. We do this through intensive consultation, which includes product design and mould design in addition to process technology. This allows us to specify the machines exactly according to your requirements. Alternative concepts are also no problem for us and are explicitly included in the evaluation of the project.



THERMOSET PACKAGE

- | | |
|---|--|
| <input checked="" type="checkbox"/> Highly wear-resistant cylinder module with liquid temperature control for granular thermosets | <input type="checkbox"/> Cylinder module with INJESTER tamping device for moist polyester |
| <input type="checkbox"/> Cylinder heating for processing thermoplastics | <input checked="" type="checkbox"/> Adaptive mould heating circuits |
| <input checked="" type="checkbox"/> Interfaces for temperature control devices | <input checked="" type="checkbox"/> Controller functions like venting and selected injection compression moulding sequence |
| <input checked="" type="checkbox"/> Air blow unit with valve and pressure reduction valve | <input type="checkbox"/> Special peripheral equipment such as brush units |

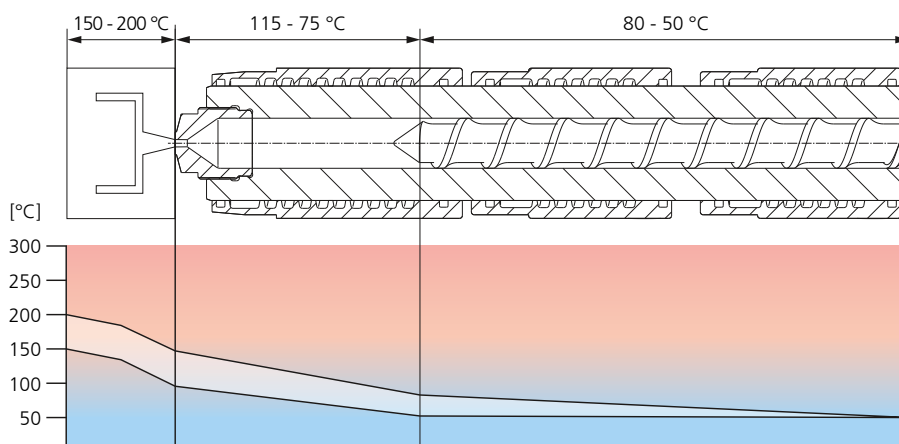
Standard Option

MATERIAL AND CYLINDER MODULES: ADAPTABLE

// Their properties and price make thermosets a highly interesting material – for example for substituting metals. Optimum processing of these special materials calls for precise temperature control in the process, a cylinder module with high resistance to the abrasive contents and suitably adapted screws. Our technology is exactly tailored towards high-quality production right from the start. //

Material for „tough cases“

Thermosets are injected from a „cold“ cylinder module into a „hot“ mould. Melting and further heating in the mould causes a decrease in viscosity that is only reversed when cross-linking increases. In the finished part, the thermoset molecules are irreversibly closely cross-linked with each other.





INJECTION UNITS FOR THERMOSETS

EUROMAP size	Screw [mm]	Injection volume [cm ³]	Pourable material	Moist polyester
70	18	23	■	
	22	34	■	
100	20	31	■	■
	25	49	■	
	30	70		■
170	25	59	■	
	30	85	■	■
290	30	106	■	■
	35	144	■	
	40	188		■
400	35	154	■	
	40	201	■	■
	45	254	■	
	50	316		■
800	45	318	■	
	50	392	■	■
	55	474	■	
	60	565		■
1300	60	664	■	■
	70	904		■
2100	70	1078	■*	■
3200	80	1608	■*	
	90	2036	■*	■*

*This configuration is only available on request

OUR EXPERTISE: ALWAYS TO YOUR ADVANTAGE.

Adapted plasticising

Our customised injection units for processing granulated thermosets and wet polyesters (BMC) offer you high production quality. For constant thermal conditions, the cylinder module and feeder feature multi-zone liquid temperature control. The highly wear-resistant design of the plasticising components protects against abrasive ingredients and ensures a long service life. Special screw geometries allow gentle processing of the material. The adjustable clearance between screw and nozzle prevents material residues.

Granular thermosets

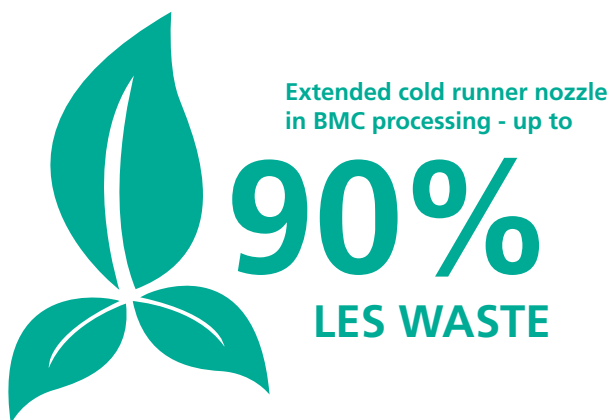
They are supplied in the form of granulate, which means they can be fed like a conventional material. Specially equipped cylinder modules ensure optimum processing:

- Compression-free screw without non-return valve
- Forward-set feed zone for L/D ratio of approximately 15:1
- Screw-in nozzle with precise temperature control

Moist polyester (BMC)

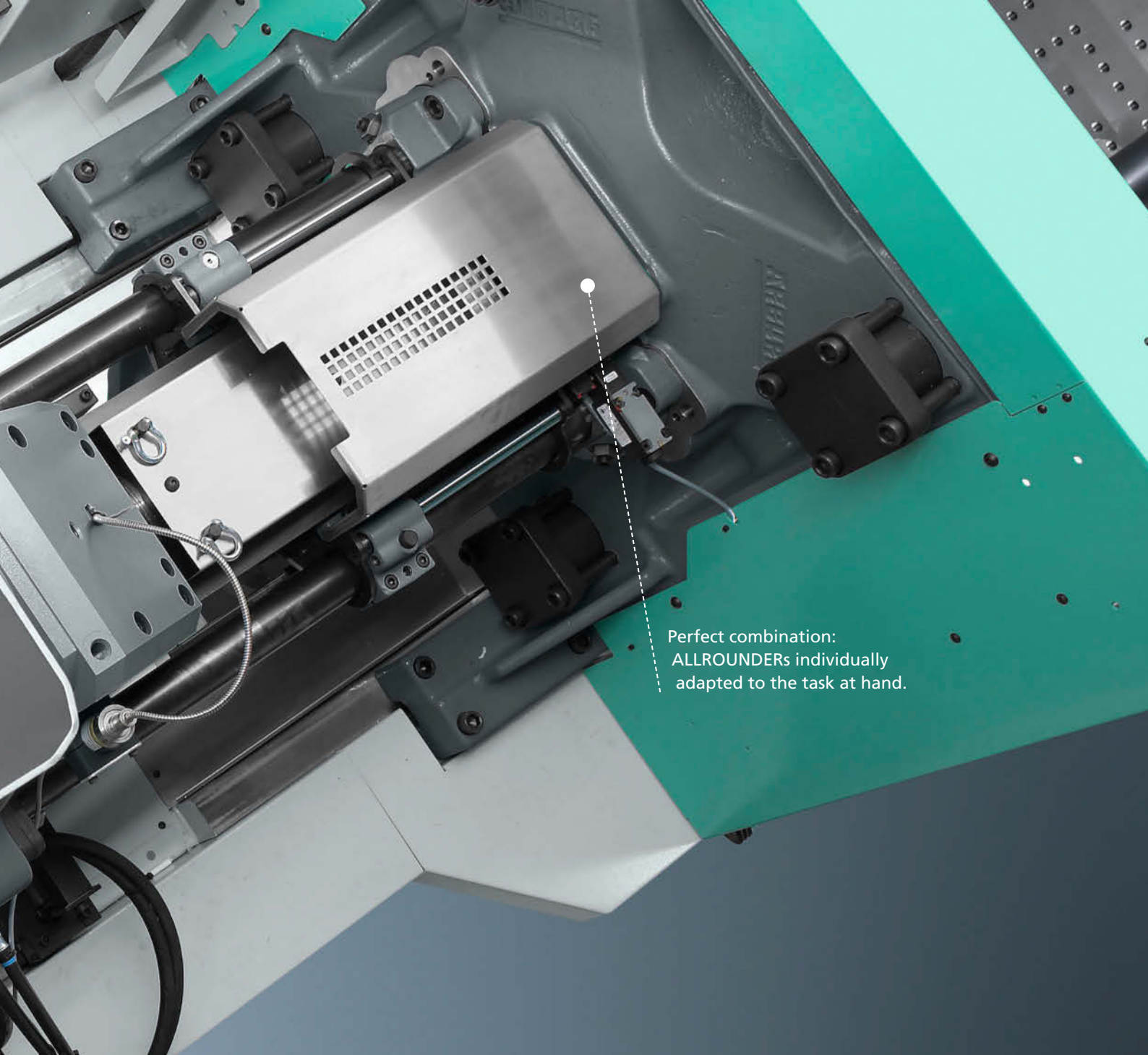
BMC is mostly supplied pre-compressed in bales. This requires an adapted material feed using our INJESTER tamping device. Special BMC cylinder modules ensure fibre-friendly processing. They feature:

- A compression-free screw with deep screw channel and vaneless non-return valve
- A forward-set feed zone for L/D ratio of approximately 12:1
- Optimised feed openings
- Temperature-controlled cold runner radius nozzles with an entry depth of 100 mm





A Question of Design: INJESTER
tamping devices available in
various designs and sizes.



Perfect combination:
ALLROUNDERS individually
adapted to the task at hand.

MACHINE TECHNOLOGY: UP TO THE TASK

// Smooth high-volume production requires top technology that meets your requirements exactly. Only a modular product range such as that from ARBURG enables you to configure the perfect machine for your application. The reliable hydraulic and vertical ALLROUNDERS in combination with our thermoset package are perfectly suited for this purpose. //



Fully integrated: The brushing unit can be programmed via the machine control system.



Further information:
Products and services brochure

Horizontal to vertical

The ALLROUNDER machines can be individually adapted through different hydraulic and electric expansion stages as well as through different arrangements of the injection units. Vertical and rotary table machines are also available for overmoulding of inserts. The technology is therefore not limited to a rigid solution concept.

Reliable hydraulics

The ALLROUNDERS for the production of thermoset parts operate hydraulically with two-circuit pump technology for simultaneous movements. We achieve precise moulding by means of the proven three-platen technology with four tie-bar guidance for even force application. The entire technology effectively counteracts burring and overfeeding.

Robotic systems and brushing units

Whether it's automated insertion and removal of components or reliable cleaning of the mould halves: ALLROUNDERS and peripheral equipment have been designed as complete solutions and can be operated via the machine control system.

Comprehensive: A wide range of horizontal and vertical ALLROUNDERS to choose from.



WE BELIEVE IN INTEGRATION.

Gentle feed of BMC

Reliable and automated feed of materials with a high filler content? With our INJESTER tamping devices you can do it. They ensure optimum pre-compression, which results in minimal air and gas inclusions. Their delivery pressure can be adjusted via the machine control system and their storage containers can also be filled without problems during production.

Piston INJESTER: Design with hydraulic tamping cylinder

- Size 5 l and 41 l
- For injection units 100 to 1300
- Programmable delivery pressure

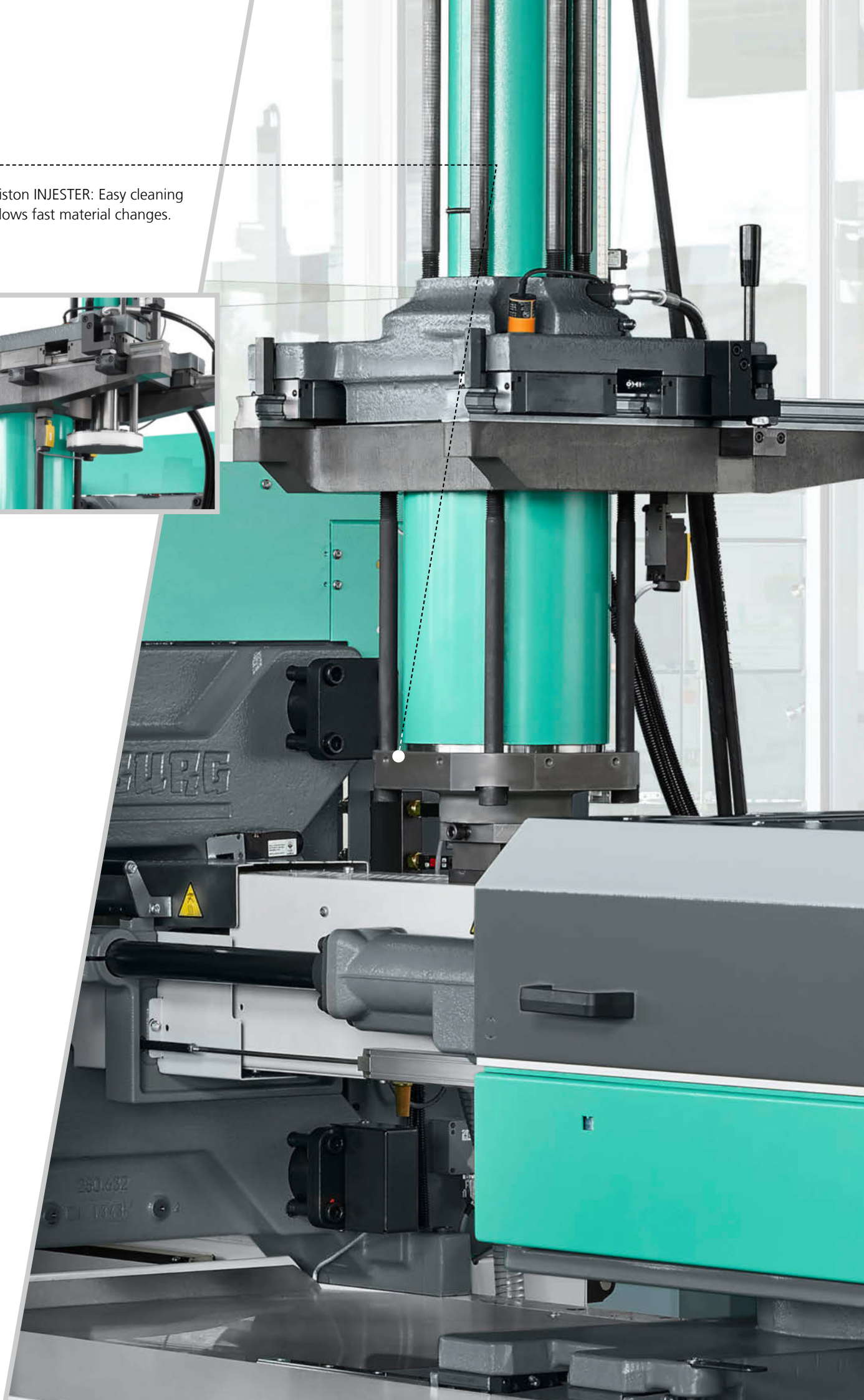
Screws INJESTER: Design with servo-electric conveyor screw

- For injection units 800 to 3200
- Programmable and regulated delivery pressure

Screws INJESTER: Large refill container allows high autonomy.



Piston INJESTER: Easy cleaning allows fast material changes.





Reliable production monitoring: Venting of the cavities is freely adjustable.

CONTROL SYSTEM: SMART

// Maintaining control over the machine, mould, robotic technology and peripheral technology requires a suitably powerful central control system. This calls for smart technology that offers extensive data integration options, monitors and adaptively controls your process, and supports you in every operating situation. All the features of our SELOGICA and GESTICA control systems are designed for a fast, secure and convenient set-up and operating process. This allows you to get the best out of all your applications. //

Highlights

- SELOGICA and GESTICA – fully compatible
- Graphic sequence programming
- Real-time plausibility check
- Assistance packages and connectivity modules – ready for digitalisation
- Central control system for complete production cells

i / Further information:
SELOGICA and GESTICA brochure

Reliable venting

During thermoset processing in particular, it is crucial that air and cross-linking gases can escape with ease. As a result, the surface is not scorched and complete mould filling is assured for void-free components. Multiple venting operations can be quickly and reliably implemented via the machine control system, even during the holding pressure phase.

Adaptive heating circuits

A high degree of temperature stability in the mould is essential for reproducible part production. Our adaptive mould heating circuits automatically adapt the control parameters accordingly. Several heating zones can be controlled simultaneously via a sensor.

Adapted injection compression moulding

Increased surface quality, high component strength and less distortion: All of this can be achieved with injection compression moulding. The compression sequence is both controlled and freely programmable via our machine controller, for example through individual selection of the starting conditions. This process can also be combined with venting. Injection compression moulding via core pull permits direct sprue separation.

Integrated peripherals

Mould, robot or peripheral equipment functions: all processes can be adjusted and centrally monitored, depending on or in synchrony with machine movements.

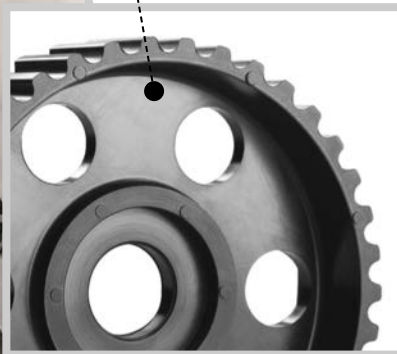
Targeted optimisation of production: selected injection compression moulding sequences with clamping unit as key.




APPLICATIONS: IN PRACTICE

// Thermosets are used across industries for „tough cases“. This makes proven and material-specific processing particularly important. Our in-depth expertise and our leading technology enable you to produce according to your precise requirements: Fast, reliable and economical. //

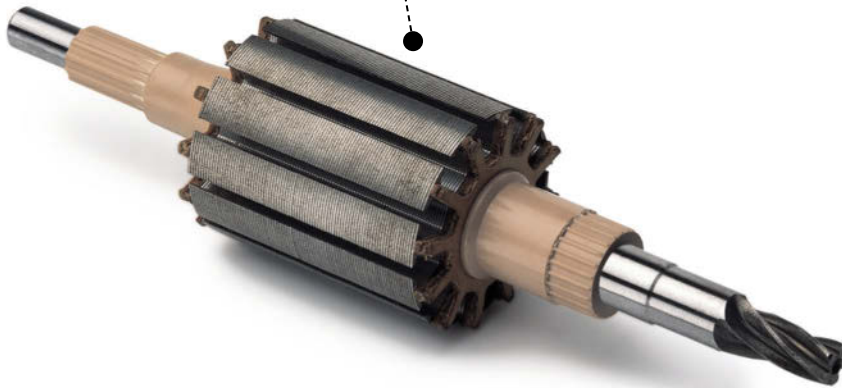
Injection moulding of belt pulley: Robust and without sink marks on the surface.



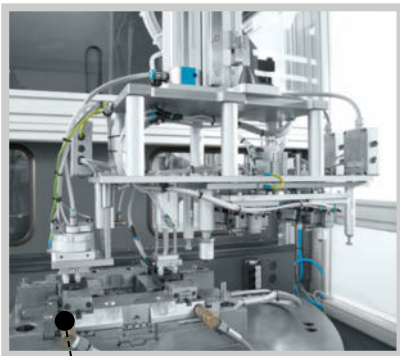
Substituting metals: Reproducible and economical injection moulding of pistons for passenger vehicle clutches.

 Further information:
Turnkey projects brochure

Armature shaft for electric motors:
Thermoset ensures a secure connection
between shaft and laminations.



Near-contour reworking of heat
shield: complete turnkey systems
from a single source.



Smoothly overmoulding inserts:
Automation ensures constant cycles
of the rotary table machine.



Efficient production of parts made
from BMC: Fill INJESTER tamping
devices during production.



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captivating, entertaining.

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