BARNES™
MOLDING SOLUTIONS



Molds
Hot Runners
Controls

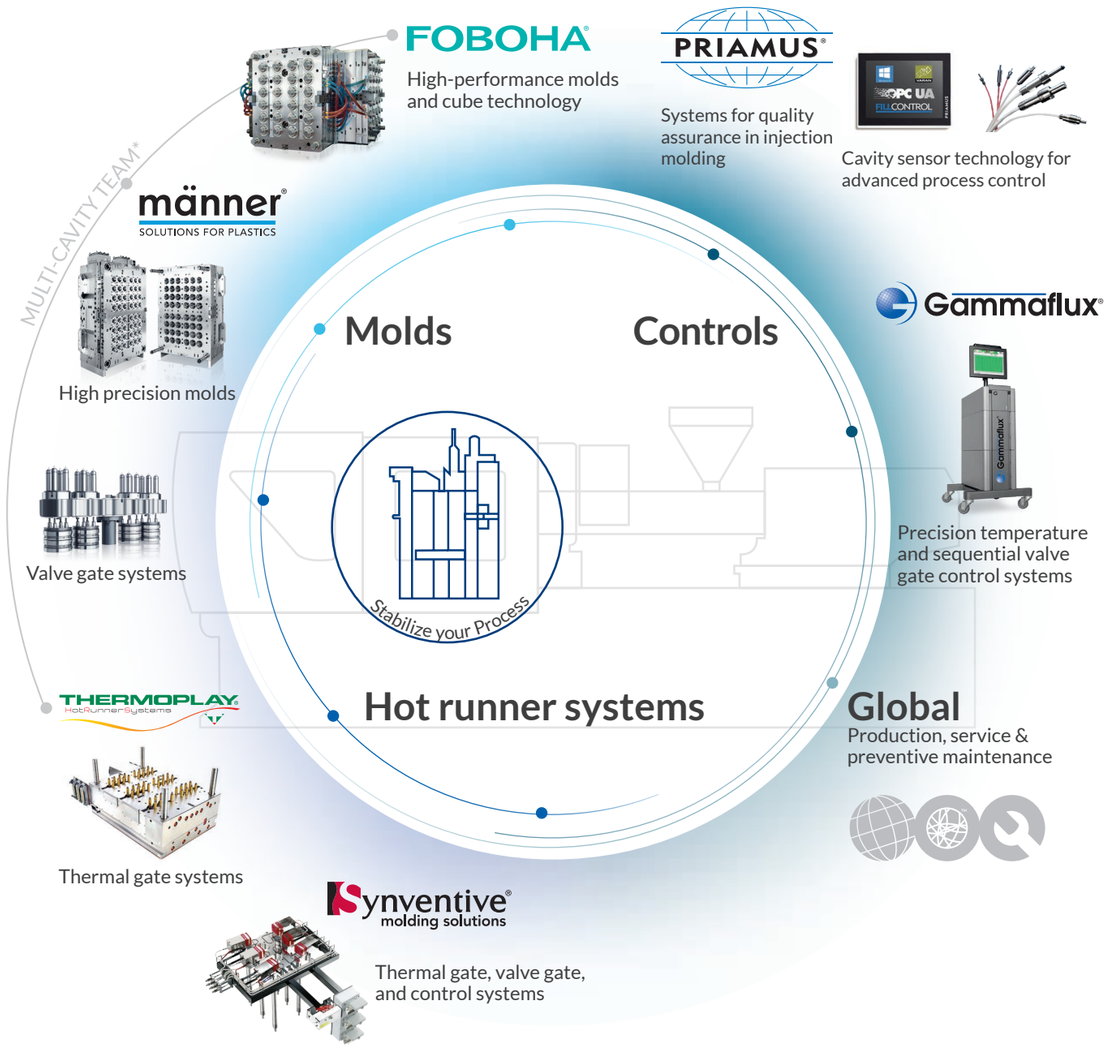
# Brands, Product and Technology Overview

Synventive molding solutions · THERMOPLAY HotRunnerSysteme · männer SOLUTIONS FOR PLASTICS · FOBOHA · PRIAMUS · Gammaflux

# Welcome to Barnes Molding Solutions

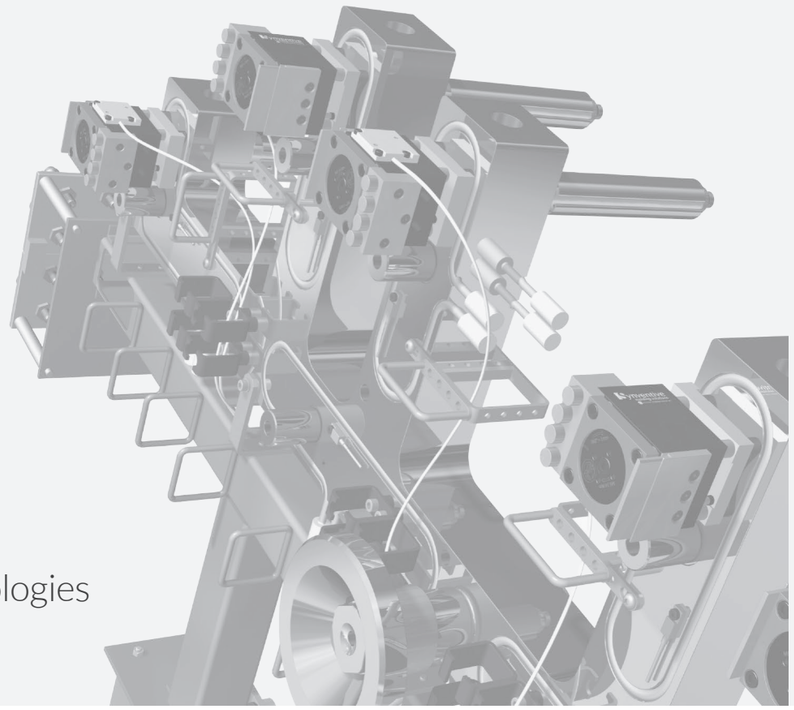
At Barnes Molding Solutions, we focus on delivering the most customized and reliable production solutions for all of your specific injection molding needs.

We are the world's only supplier with the capability to combine know-how technology for **injection molds, hot runners, monitoring** and **control systems.** From prototype molds to high-volume production molds, you benefit from our end-to-end solutions. We focus on providing carefully coordinated products and naturally balanced systems that enable outstanding performance of the entire molding solutions ecosystem. Take advantage of our global footprint including shared manufacturing sites in Europe, the Americas and Asia with dedicated consulting and service teams.




* The Multi-Cavity team is specialized in the development of customized solutions for molds and hot runner systems for medium and high-cavity applications.

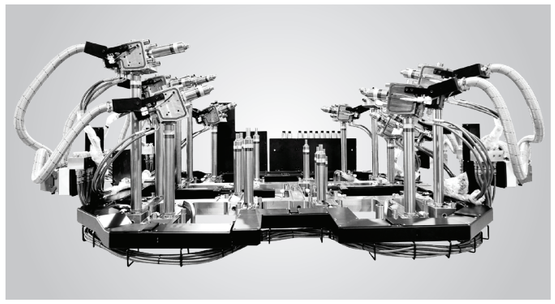
Synventive molding solutions
A business of BARNES



# Synventive

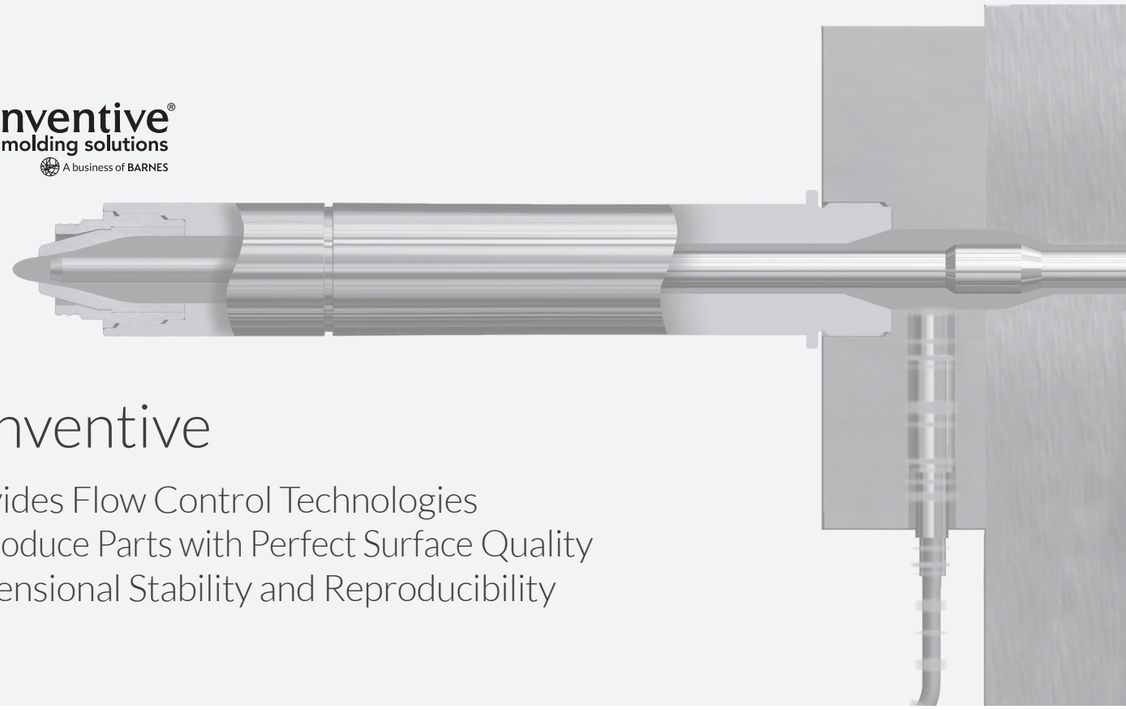
## A Global Leader in Hot Runner Systems and Valve Gate Control Technologies

- Open gate and valve gate
- Leakproof operation
- Precise gate control
- Uniform temperature – profiled heaters
- Optimal, energy-saving temperature uniformity
- Stronger mold integrity due to reduced nozzle cut-out
- Easy replacement of heaters and thermocouples
- Short assembly times at initial installation
- Excellent gating qualities
- Easy to service during production
- Mold fill analysis



Large pre-wired and angled Hot Runner System.

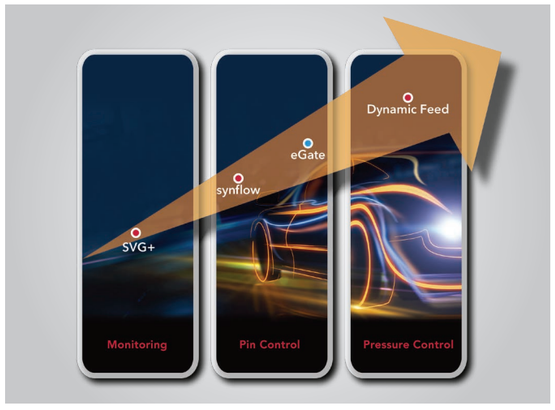
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# Synventive

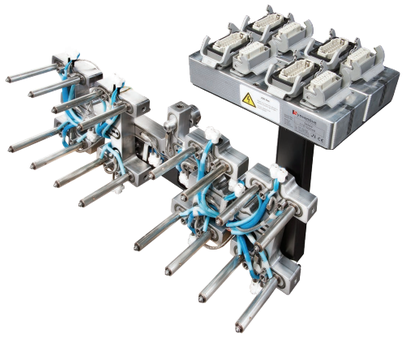
## Provides Flow Control Technologies to Produce Parts with Perfect Surface Quality Dimensional Stability and Reproducibility

- Reproducible pin opening process
- Advanced process setup and monitoring
- Avoids excessive pressure loss and shear of conventional molding process
- Increased part's quality: surface finish, geometrical accuracy
- Increased part to part & shot to shot consistency
- Easily solve balancing challenges
- Less impact of viscosity variations
- Provides for higher production rates

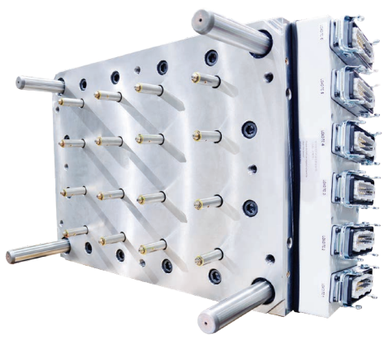



Synventive's expanding portfolio ranges from simple monitoring systems, to fully closed loop pressure control.

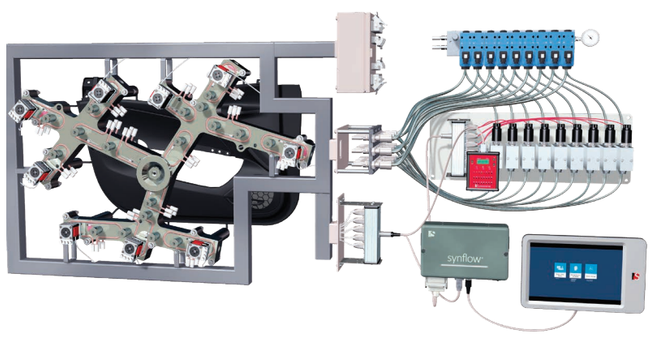
Synventive hot runner systems are available pre-wired, pre-plumbed, pre-assembled or as a complete hot-half, all allowing for easy Plug 'n Play® installation.



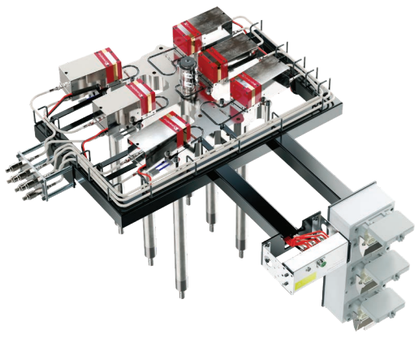
**Synventive** Plug'n Play® Pre-assembled, customized hot runner systems.



**Synventive** hot half
16-drop actuation plate hot runner systems.




**Synventive** synflow 3
Advanced melt flow control technology.
Valve opening control for hydraulic valve gate systems in cascade molding.



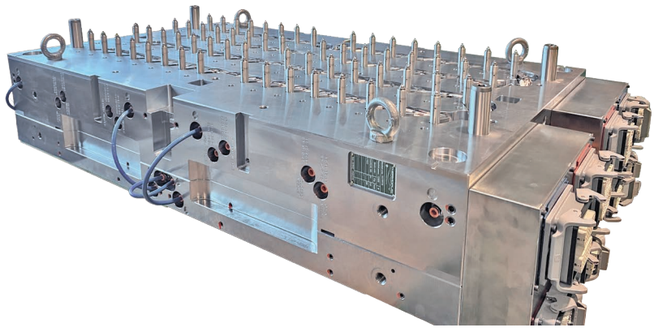
**Synventive** eGate® sync
Advanced electric actuation for applications on large parts. Cleanliness, energy efficiency and precision.



# Thermoplay

## Hot Runner System Solutions for Packaging, Closures and Thin Wall Applications

- Robust portfolio of standard solutions for direct injection in each application segment
- Best thermal profile for processing all resins
- Best in class for low energy consumption
- Easy handling and maintenance
- The way the distribution manifold is “bolted down” and the sealing between nozzle cut-out and manifold housing guarantee a leakage proof system operating. (against wrong process temperature, cold start, tip damage)



**Thermoplay** hot half
64-drop with 3DP plung through valve gate.



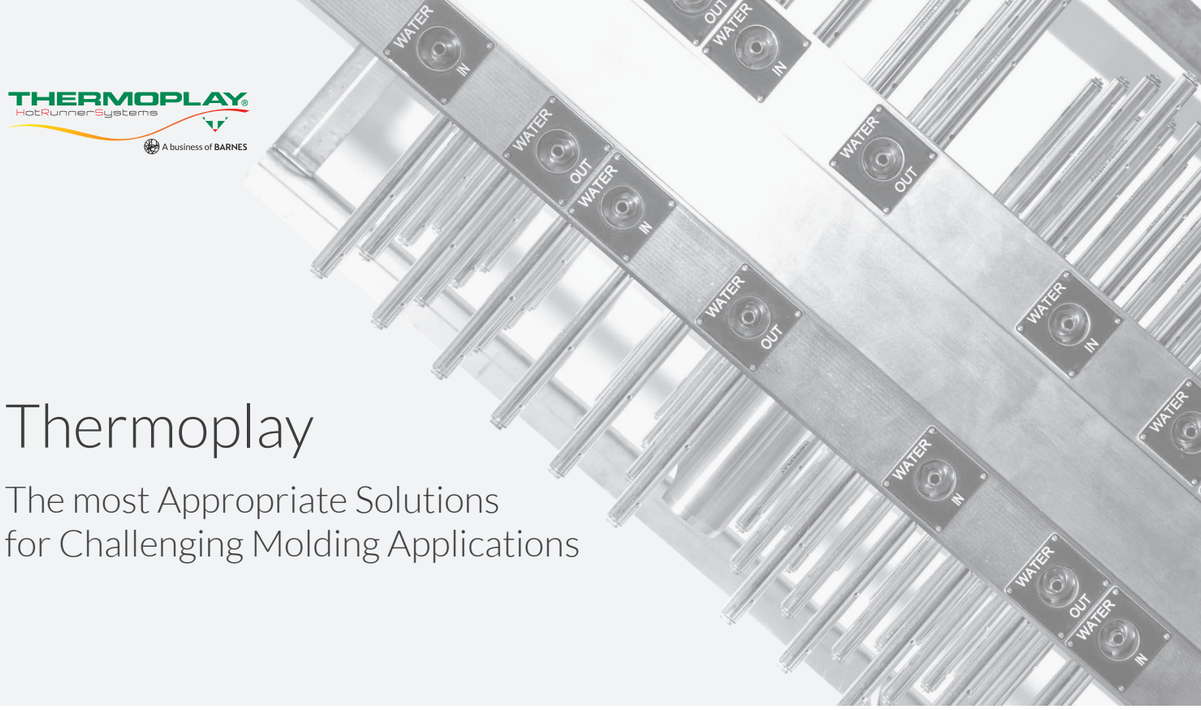
**TD Nozzle series**
Best reliability with requirement of frequent mold version change.



**TF Nozzle series**
Widest tips and sizes portfolio.



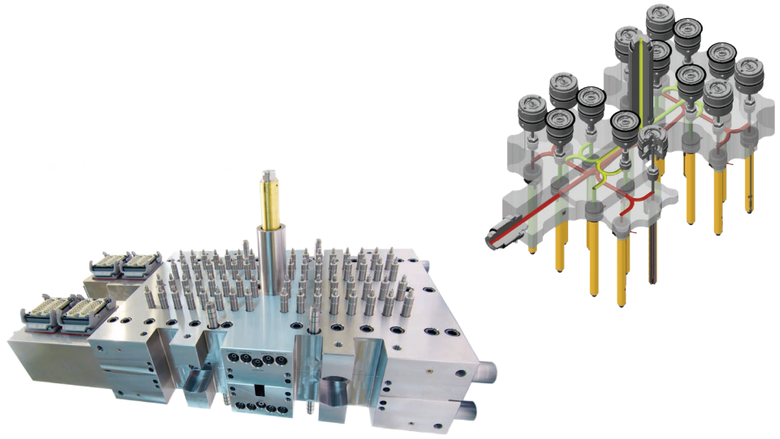
**Thermoplay** TH-PK and TH-3DP nozzle series. Thermal and valve gate solutions designed for fast cycle times and high cavitation molds.




# Thermoplay

## The most Appropriate Solutions for Challenging Molding Applications

- Thermal side gate nozzles, with tip blocks assembled from the parting line and conventional cylindrical sealing (between tips and cavity) widen the perspective of the side gating technology to new application frontiers (e.g. electronic, automotive and industrial component)
- Deep knowledge on material science and numerical validation for the best approach to tailored made solutions in case of challenging applications
- In house design and manufacturing of nozzle heater bands allows the best heat management with approx. no limits in design freedom
- Long experience in direct injection when the vertical, central gating is not feasible (angled tips, multi tips, multi-nozzle) also with technical resins



**Thermoplay** hot half
128-drop (64+64 stack) with TD-1B thermal gate.



**Thermoplay** TFS nozzles series
Multi-drop thermal gate hot runner system for side injection.

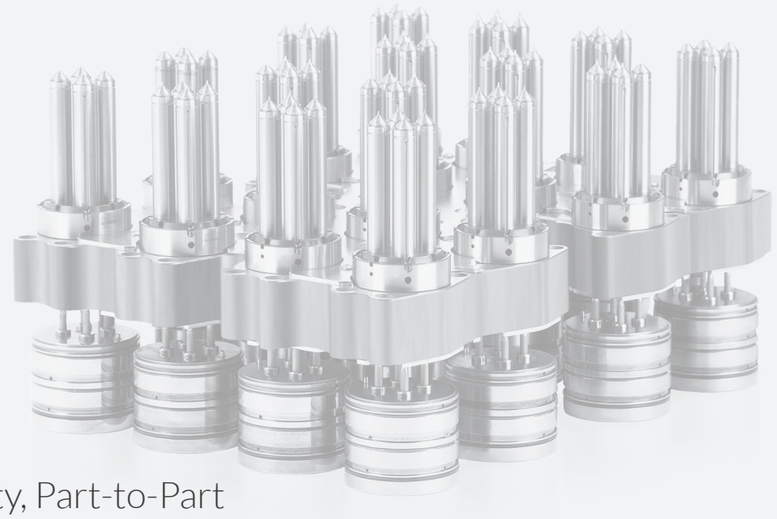


**TH-L45 & TH-5** nozzle series
Multi-drop and angled injection thermal gate hot runner systems.



**Multi** nozzles
Available thermal and valve gate.

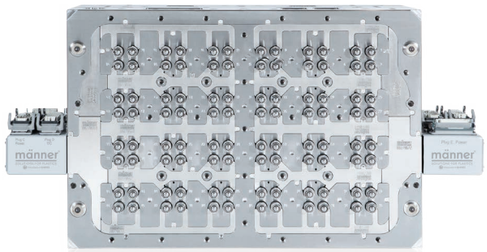
männer
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# männer

## Cylindrical Hot Runner Valve Gate Systems for Impeccable Surface Quality, Part-to-Part Consistency, and Process Reliability

- High quality finishing and perfect gate quality
- Short cycle times
- Ideal for high-volume production
- Economical use of material
- For narrow processing windows
- Extreme durability wear and maintenance
- Gentle treatment of materials
- Large gate cross section, Minimal pressure drop, Low shear rates
- Clean room compatible (pneumatic barrel)
- Fully assembled, wired, and tested hot halves



**männer** Hot Half 96-drop



**männer** Hot Half 128-drop
MMS (Multidrop)

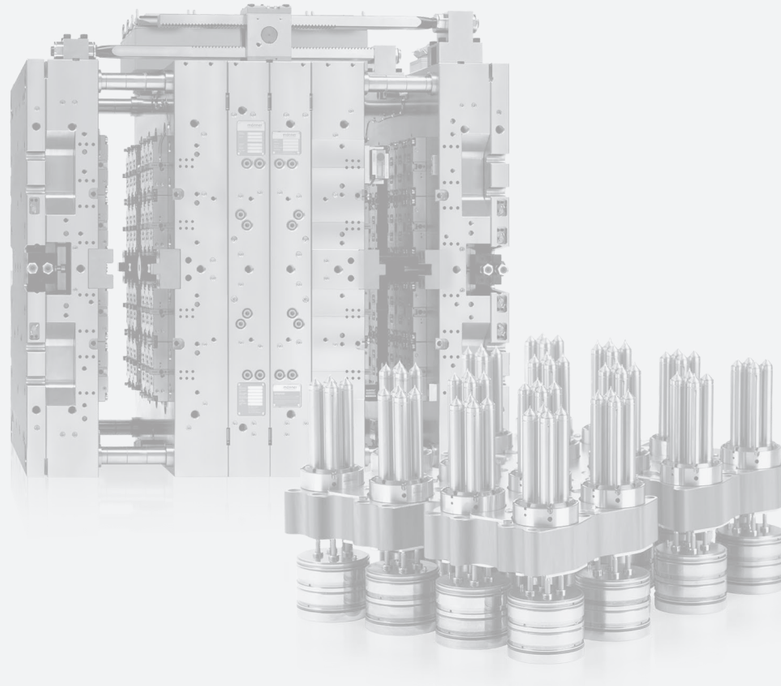


**männer** Hot Runner System
MMS (Multidrop)



**männer** Hot Half 64-drop with
electrical plate actuation (e-plate)

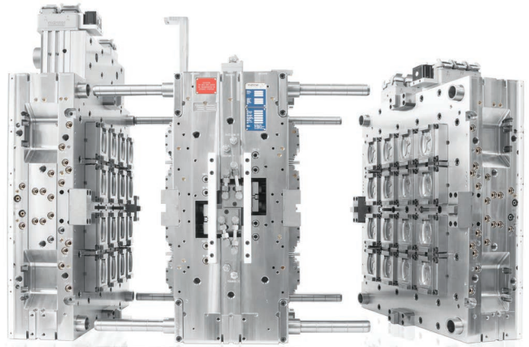
männer
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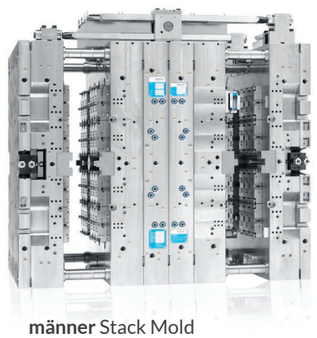
# männer

## High Precision Molds for Large-Volume Production of Precision Injection-Molded Parts

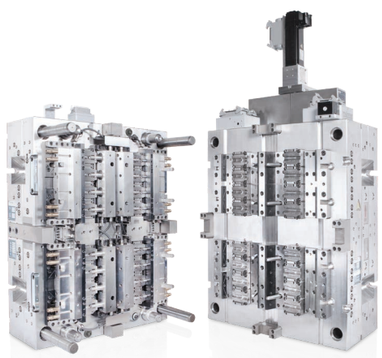
- All high-precision molds are developed with an eye on part-to-part consistency and reproducibility, which are essential to automated downstream processing of the injection-molded parts
- Dozens of years of experience in development and manufacturing of medical disposables, IVD products, pharmaceutical devices and pipette tips
- Extensive simulation capabilities
- Many years of experience and resources in mold qualification
- Extremely durable, high-performance molds with high repetition accuracy, long life, optimized temperature control for short cycle times and easy maintenance



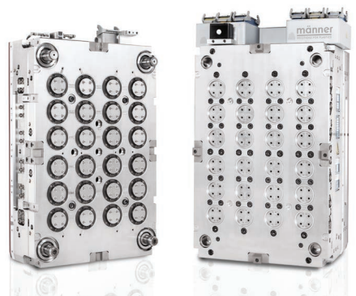
**männer** Twin Stack Mold
16+16 cavities



**männer** Stack Mold
32+32 cavities



**männer** Singleface Mold
16 cavities electrical plate actuation (e-plate)




**männer** Singleface Mold
96 cavities

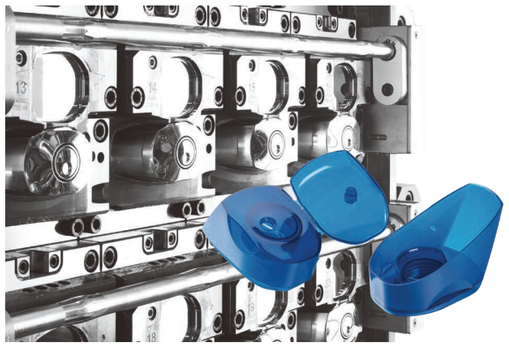
FOBOHA
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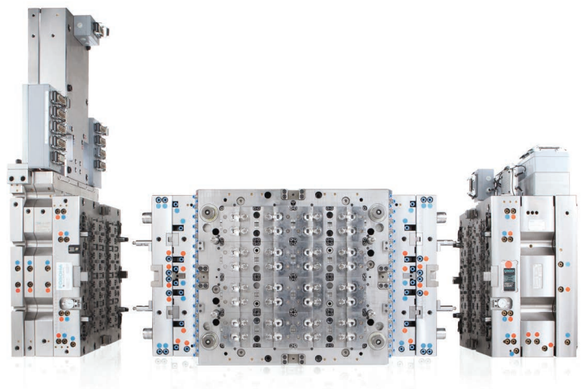
# FOBOHA

## For More than 50 Years, FOBOHA Has Represented Innovative Solutions and Uncompromising Quality in Molding

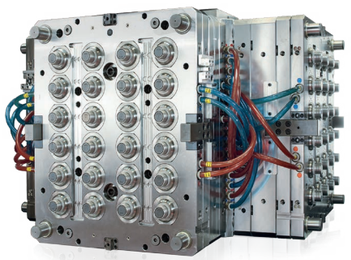
- Anti-counterfeiting closures
- Integrated seals
- Tamper-evident closures
- Tight pitch in compact molds
- Internal injection
- Injection close to the core
- Recyclable materials
- Oxygen barrier plastics
- Fast color changes



**FOBOHA** Singleface Molds
Tailored to customer needs anywhere in the world, we develop and build high-performance injection molds with maximum output volume and availability.

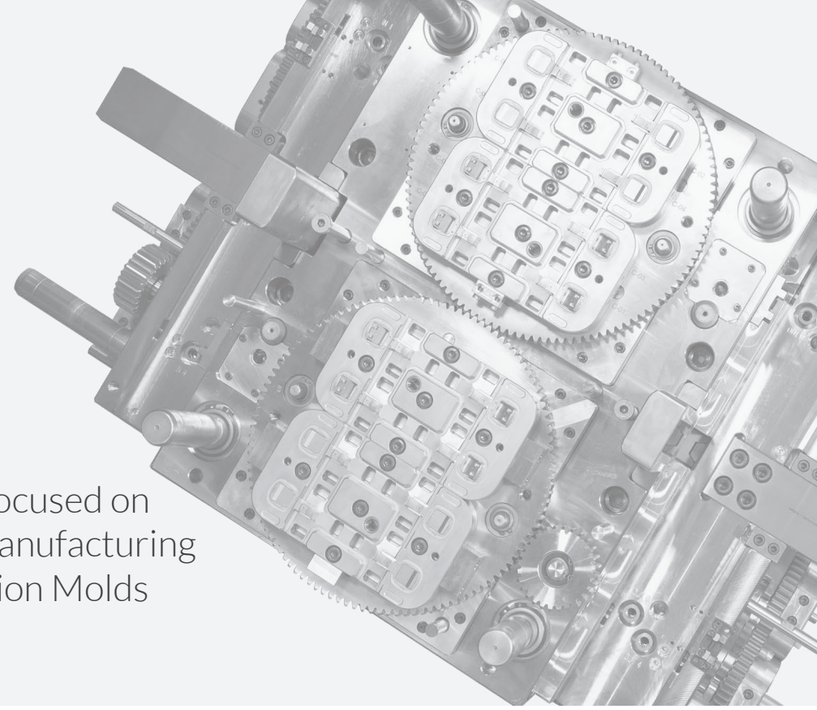


**FOBOHA** cube mold
32+32 cube mold for 2-component injection molding.



**FOBOHA** cube mold
24+24 cube mold for 2-component injection molding.

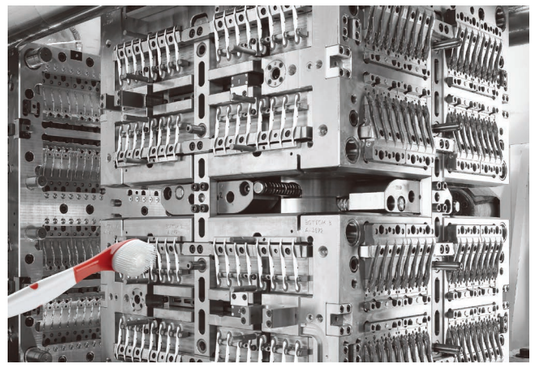
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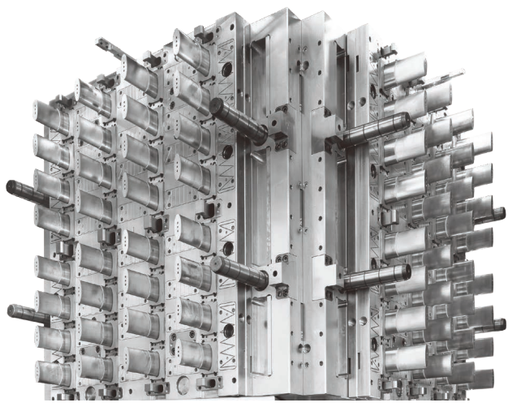
# FOBOHA

## Cube Mold Specialists Focused on the Development and Manufacturing of Efficient Plastic Injection Molds

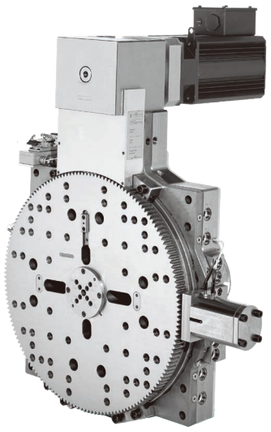
- Single-Component Molds
- Maximum output volume and availability
- Multi-Component Molds
- Production of highly complex parts on a single machine.
- Stack-Turning Molds and Cube Molds
- The clamping force of the machine can be halved
- Cavities can be doubled
- Production cycles are significantly shorter



**FOBOHA** STACK-TURNING molds
With the FOBOHA stack-turning technology, parts are processed within the turning system at different levels. So it is possible to inject parts on both levels in the same production step and eject the finished parts at the available station.



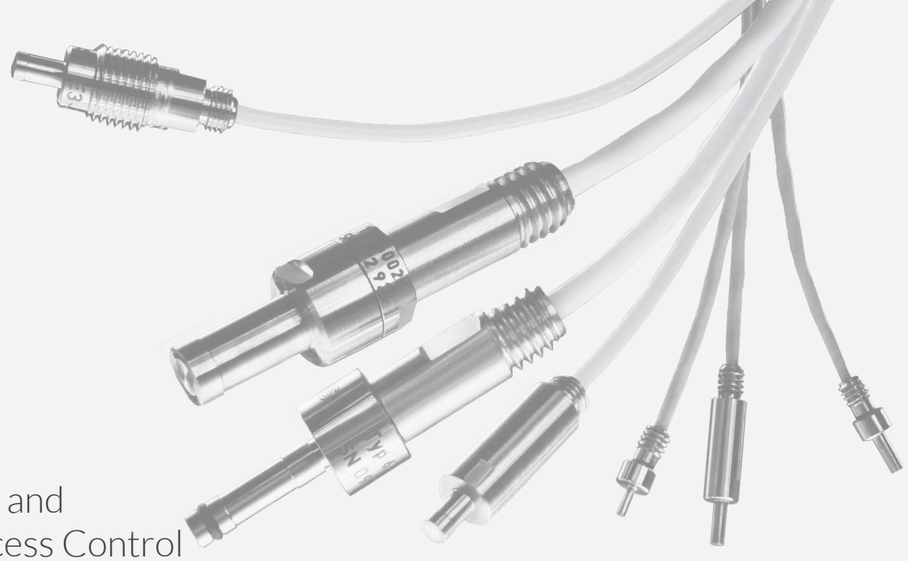
**FOBOHA** MULTI-COMPONENT mold
Our multi-component molds set the standard for the production of plastic multi-component parts.



**FOBOHA**
Rotary table & turning system

We develop and build all turning systems inhouse. Advantages of our patented technology:

- Robust and easy to maintain
- Precise positioning through mechanical indexing
- Choice of hydraulic or servo-electric drive
- Short rotation times



# Priamus

## A Leader in Open and Closed Loop Process Control with Optimized Cavity Sensors

# Priamus

## Advanced Monitoring to Ensure your Part Quality



FILLCONTROL




**FILLCONTROL** is the modular process monitoring and control system from PRIAMUS that can be flexibly adapted to all the individual customer requirements. Documenting, monitoring, open-loop or closed-loop process controlling. **FILLCONTROL** covers all applications with the appropriate module.



**FILLCONTROL Control H:**
Automatic balancing/synchronization of filling of all cavities by adjusting hotrunner tip temperatures.



**FILLCONTROL Control P:**
Automatic process and machine control with cavity sensors.



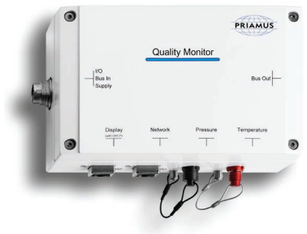
**FILLCONTROL Control V:**
Automatic balancing/synchronization of filling of all cavities by automatically adjusting the opening times of the valve gate nozzles.

**FILLCONTROL Measure:**
A free-of-charge software module for measuring data

**FILLCONTROL Monitor:**
The centrepiece of the system, is a comprehensive process monitoring module that serves as the basis for all PRIAMUS systems.

**FILLCONTROL Switch:**
Generates real-time switching signals on detection of the melt front and thus enables targeted open-loop process control depending on the flow process.

## Quality Monitor™ – The Overall System for Easy Process Monitoring




**Quality Monitor™** is used for simple and reliable monitoring of the industrial injection molding process and is based on real process parameters. The basis for this is the process information obtained from the cavity pressure and cavity temperature sensors.

**The Quality Monitor™** user interface can be displayed on any browser on a web-enabled device.

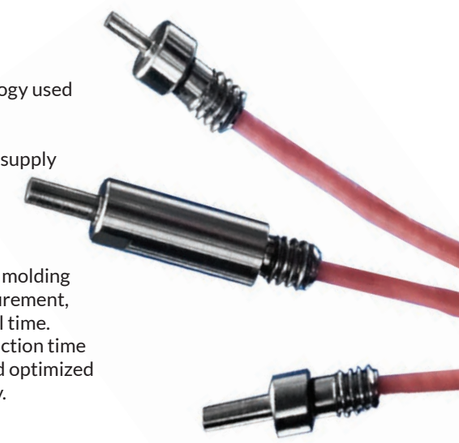


## Priamus Cavity Pressure and Temperature Sensors for Dynamic Temperature Measurement

PRIAMUS sensors are unique. Their design, reaction speed and the connection technology used have been optimized for the injection molding process.

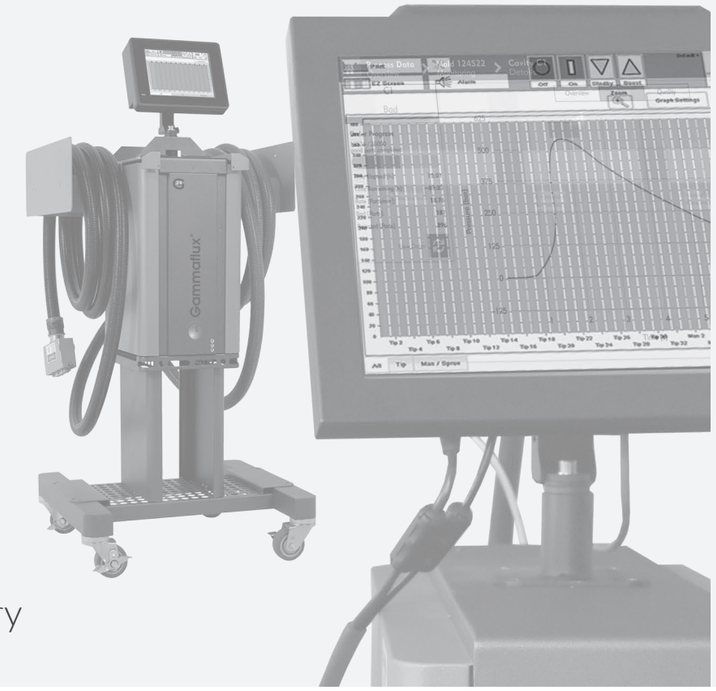
PRIAMUS Cavity pressure sensors are active sensors, which means that neither power supply or electronics are installed in their housing. This makes the sensor a real flyweight. Yet thanks to the right technology, they can easily withstand the high temperatures in the injection mold despite their small size and weight.

Temperature plays a decisive role in the injection molding process because the injection molding process cannot be described by cavity pressure alone. In addition to temperature measurement, cavity temperature sensors are also used to detect the position of the plastic melt in real time. In order to correctly control and regulate the injection molding process, a very short reaction time of the sensors is crucial. PRIAMUS cavity temperature sensors have been developed and optimized especially for this task. Each sensor is also checked for its reaction speed before delivery.



# Gammaflux

## The Leading Supplier of Hot Runner Temperature and Sequential Valve Gate Control Systems for the Plastics Industry



- Easy to use (New mold wizard)
- Attractive value
- Smaller
- Faster
- More flexible / standardization
- Improved interlocks
- Mold Doctor®
- Early material / plastic leak detection
- 5 Year warranty



**Gammaflux** G24 Hot Runner Temperature Controller with up to 192 zones in one cabinet.



**Gammaflux** G24 Temperature controller with integrated Sequential Valve Gate Controller (SVGC).



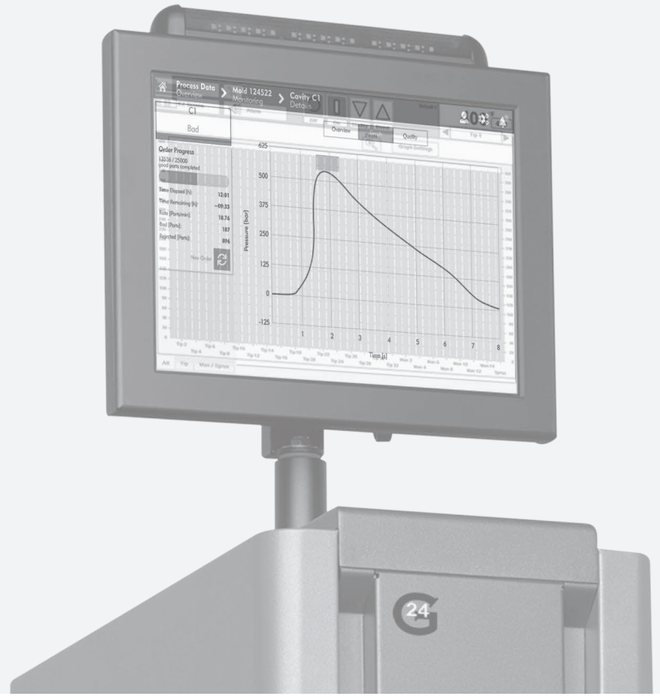
**Gammaflux** LEC
Designed for smaller hot runner system applications, the LEC is offered with 2, 6 and 12 zone enclosures.



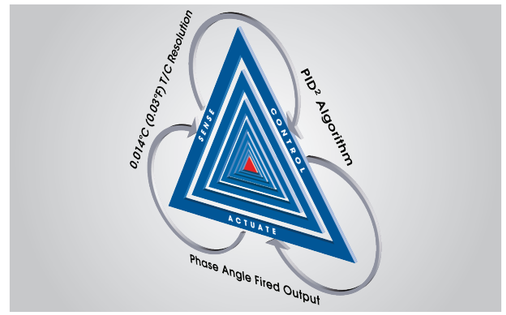
The optional cable hanger can be added to any G24 controller.

# Gammaflux

## Measuring and Control Equipment in the Injection Molding Industry



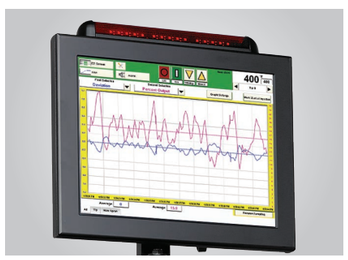
- Enhanced part quality
- Reduced scrap
- Improved part weight consistency
- Material savings
- Higher profit margins
- Reliability
- Protection to Hot Runner wear




All Gammaflux controllers feature the unique Triangulated Control Technology® that allows controllers to sense, control and actuate up to 20 times per second to achieve better temperature control. Gammaflux utilizes PIDD.



**Gammaflux** Mold Doctor® is an off-line (tool room), advanced troubleshooting tool.



**Gammaflux** Gammavision® chart recorder and statistical analysis software.



**Gammaflux** Cavity Map Pro™ quickly creates a cavity map that is saved with the mold menu.

## USA - Production Locations

**Synventive Molding Solutions Inc.**
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## Asia - Production Locations

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