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05/22 Technical specifications subject to change.

## Valve Gate Hot Runner Systems

### Production Locations

[www.maenner-group.com/production\\_locations](http://www.maenner-group.com/production_locations)

### Sales & Service

[www.maenner-group.com/sales-service](http://www.maenner-group.com/sales-service)



# Tailored Valve Gate Systems

Hot runner technology has a crucial impact on cost effectiveness and part quality in injection molding. As a pioneer in hot runner technology, we focus on the development and manufacture of cylindrical valve gate systems – recognized as the best hot runner solution for achieving impeccable surface quality, part-to-part consistency, and process reliability. All valve gate systems are tailored and designed to meet the specific needs of our customers.



**Personal Care**  
Impeccable surfaces  
Superior gate quality



**Medical/Pharma**  
High precision and part-to-part consistency  
Hygienic surface quality



**Caps and Closures**  
Tightly spaced configurations  
High-speed molds



**Small Parts**  
Ultrasmall shot weights  
Short material dwell time



**Thin Wall Packaging**  
High flow rates  
High injection speeds



**Technical Parts**  
Technical high-temperature resins  
with narrow processing windows



# Personal Care

Consumers are picky. Cosmetic and personal care products must have an impeccable look and feel. Meanwhile, the use of resins containing Iriodin is increasing, and frequent color changes are in demand. The plastic parts of these products are generally used every day, which means their functional areas must be able to withstand a high degree of stress. The nozzle design of the Cylindrical Valve Gate facilitates stress-free injection of the melt and enables processing of cutting-edge high-performance resins.



# Medical/Pharmaceutical

When it comes to producing medical devices and disposables, high precision, part-to-part consistency, and cleanliness are vital. MÄNNER's original valve gate delivers virtually noncontact injection points for hygienic surface quality and stable processing – enabling consistent, reliable production.



Nozzle spray head

Head

Pregnancy test kit

Nozzle spray head

Spray head for deodorant



Petri dish

Contact lens packaging

Insulin pen

Inhalers

Break-open cap

Needle protector

Y-Connector

System*	Nozzle design*	Resin examples
MSS (Singledrop)	SPECIAL EX., MCN-CC (Caps & Closures)	ABS, PC, PC/ABS, SAN, PS, PET, PET-G, PCT-G, TPE-S, TPE-O, TPE-U
MMS (Multidrop)	SPECIAL EX.	
MES (Stack)	SPECIAL EX.	

\* Recommended systems and nozzle types

System*	Nozzle design*	Resin examples
MSS (Singledrop)	STANDARD, SPECIAL EX., MCN-I	PC, COC, COP, PS, ABS PMMA, POM, PBT, TPE-S, TPE-O, TPE-U, TPE-V
MMS (Multidrop)	STANDARD, SPECIAL EX.	
MES (Stack)	STANDARD, SPECIAL EX.	

\* Recommended systems and nozzle types

# Thin-Wall Packaging

With the high flow rates and injection speeds required for rapid-process thin-wall packaging, friction within the nozzle tip and gate orifice is a critical factor. To ensure that the melt reaches the cavity under optimum conditions, we rely on valve gate systems capable of operating within extremely narrow tolerance ranges. At the same time, the geometry of the flow channel within the nozzle greatly affects results.



# Caps and Closures

Plastic closures for the food and beverage industry as well as for cosmetics and personal care products are generally produced in high-cavitation, high-speed molds. In cases like these, valve gate systems are vital to achieving very short cycle times. Particularly in the production of flip caps, spacing within the mold can become quite tight. männer's SLIMLINE was designed specifically with these types of applications in mind.



Container (IML)



Thin-wall lid



Ice cream packaging



Yogurt container (IML)



Lid with safety lock



Closures



Tamper-proof cap



Flip cap



M-Cap



Sports Cap



Beverage closure

System*	Nozzle design*
MSS (Singledrop)	STANDARD, WEARPROOF, MCN-P (Packaging)
MES (Stack)	STANDARD, WEARPROOF

Resin examples
Polyolefins (MFI 40-100), PP, PE, PE-LD, PE-HD

\* Recommended systems and nozzle types

System*	Nozzle design*	Resin examples
MSS (Singledrop)	STANDARD, WEARPROOF, MCN-CC (Caps & Closures)	Polyolefins (MFI 5-80), PP, PE, PE-LD, PE-HD, PET, PET-G, PCT-G

\* Recommended systems and nozzle types

## Small Parts

When units are produced in large numbers, designing molds for small injection-molded parts having geometries that are often demanding can be a real engineering challenge. The construction of compact molds with numerous cavities, core-pulling mechanics, and hot runners is extremely complex – and every millimeter counts. MÄNNER's valve gate nozzles are thermally insulated from their working environment to ensure process reliability despite tight spacing conditions. The design principle helps to shorten material dwell time within the system to enable gentle processing of the plastic.



System*	Nozzle design*	Resin examples
MSS (Singledrop)	WEARPROOF, SPECIAL EX., MCN-I	Polyolefine PP, PE (reinforced/unreinforced), POM, PBT, PA (PA6, PA66, etc.), ABS, PS, PC, COC, COP, PMMA, PET, PET-G, PCT-G, TPE-S, TPE-O, TPE-U
MMS (Multidrop)	STANDARD, WEARPROOF, SPECIAL EX.	

\* Recommended systems and nozzle types

## Technical Parts

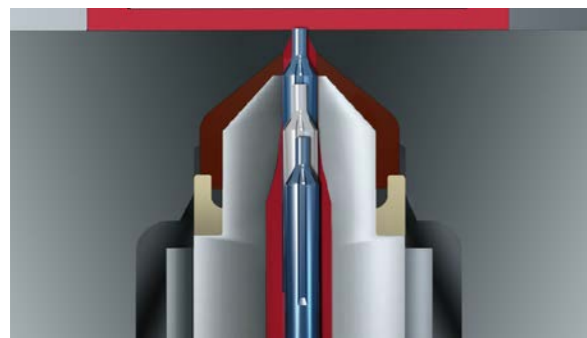
When it comes to processing demanding materials such as filled and abrasive resins or semicrystalline/engineered resins, the use of exceptionally wear-resistant special materials is essential. MÄNNER's tailored valve gate systems are designed for worry-free extended operation, even when working with difficult-to-use materials with extremely narrow processing windows.



System*	Nozzle design*	Resin examples
MSS (Singledrop)	WEARPROOF, SPECIAL EX., MCN-H	Polyolefins PP, PE (reinforced), PMMA, PC, PC/ABS, ABS, PBT, PA (PA6, PA66, PA46, etc.), PPE, PPS, PET, PET-G, PCT-G
MMS (Multidrop)	WEARPROOF, SPECIAL EX.	
MES (Stack)	WEARPROOF, SPECIAL EX.	

\* Recommended systems and nozzle types

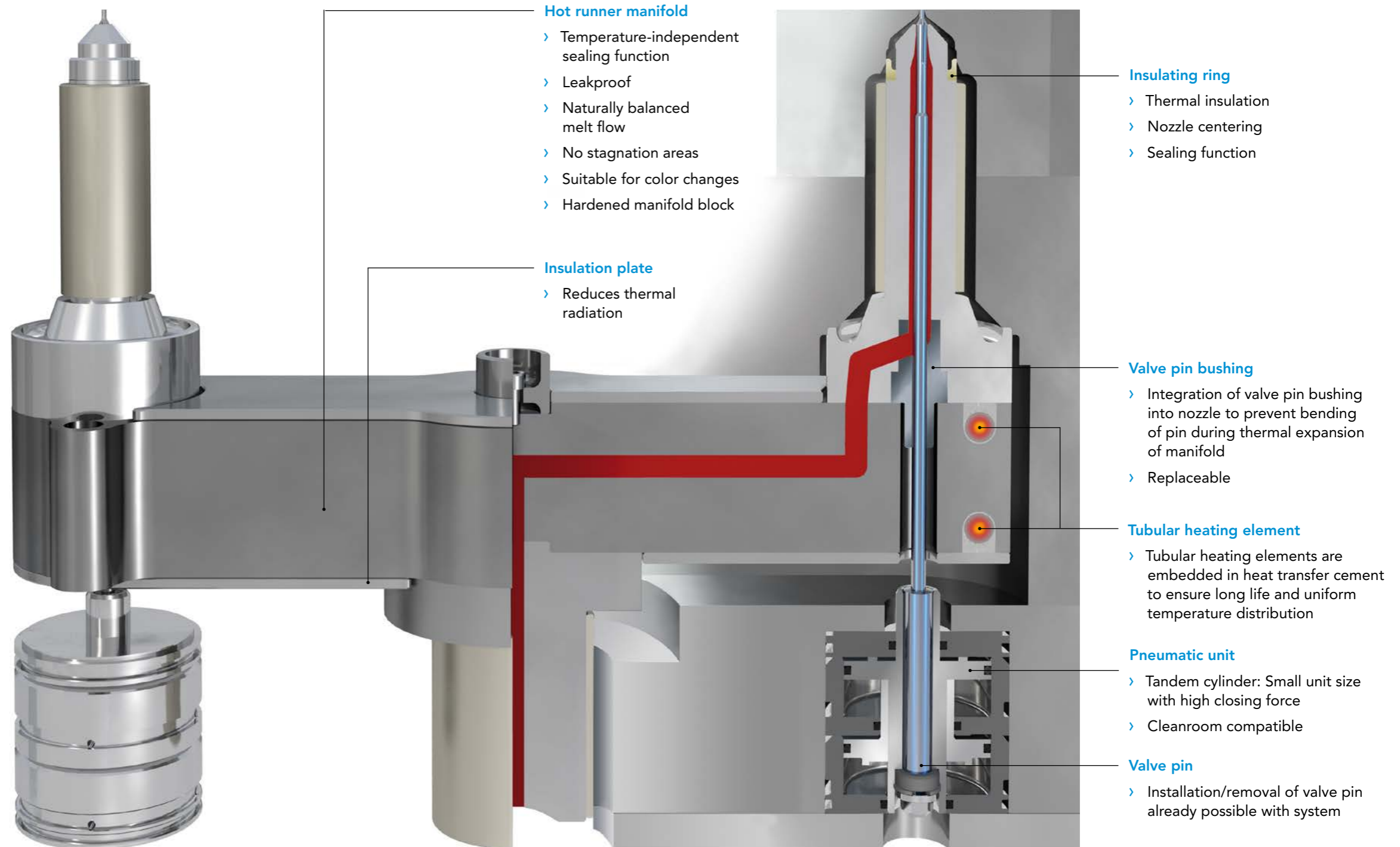
# Cylindrical Valve Gate – the original by männer



## Precentered Cylindrical Valve Gate

During the closing movement, the valve pin is first precentered by an angled guide area and then positioned perfectly in the gate orifice by means of a cylindrical guide. Nozzle and valve pin are designed to provide maximum performance and extreme durability.

- > Superior gate quality
- > Large gate cross section
- > Minimal pressure drop
- > Low shear rates
- > Extreme durability wear and maintenance
- > Defined opening and closing of the gate orifice
- > Processing of demanding materials with narrow processing windows
- > Short cycle times
- > Individual heating control
- > Cascade injection molding possible
- > Clean room compatible (pneumatic barrel)



# Systems and Nozzle Types

## Systems

### MSS (Singledrop)

- › Large selection of nozzle types for a wide range of applications
- › Custom manifold systems with 1 to 192 cavities
- › Nozzle types STANDARD, SPECIAL EX., WEAR-PROOF, MCN-I, MCN-H, MCN-CC



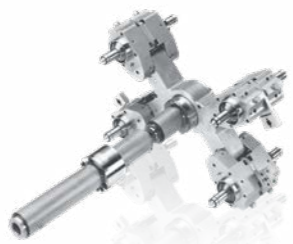
### MMS (Multidrop)

- › Ideal for applications with tightly spaced cavities
- › For production of parts with low shot weights
- › 2- to 4-point nozzles available with different axis spacing
- › Custom manifold systems with 2 to 256 cavities
- › Nozzle types STANDARD, SPECIAL EX., WEARPROOF



### MES (Stack)

- › A cost-effective solution for high-volume production
- › Opposing injection points lie on a single axis
- › Double the output with the same closing force
- › Split snorkel enables easy access to parts by handling systems and permits parts to fall freely from the mold
- › Two or four parting lines possible
- › Nozzle types STANDARD, SPECIAL EX., WEARPROOF



### MZS (Central)

- › Central injection combined with valve gate technology
- › For single-cavity molds used in producing parts with large areas
- › For pilot/pre-production molds
- › Nozzle types STANDARD, SPECIAL EX., WEARPROOF, MCN-I, MCN-H, MCN-P, MCN-CC



## Nozzle Types

### STANDARD

- › Available in many different lengths and diameters
- › Suitable for processing virtually all commercially available thermoplastics



### WEARPROOF

- › Specifically designed for processing filled and abrasive resins
- › Constructed of special, highly wear-resistant materials for long life and durability
- › Ensures reliable, extended operation when processing demanding resins



### SPECIAL EXECUTION

- › For processing amorphous as well as semicrystalline resins
- › For processing resins with narrow processing windows
- › For processing lightweight parts



### MCN – männer Combi Nozzle Series

Basic body coupled with custom nozzle tip tailored to specific applications.

#### MCN-I (Insulated)

- › Specifically designed for transparent applications requiring superior surface quality and for polyester



#### MCN-H (High Temperature)

- › For processing technical and semi-crystalline resins at high temperatures



#### MCN-P (Packaging)

- › Stable version for high injection pressures, high injection speeds and short cycle times



#### MCN-CC (Caps & Closures)

- › Special calotte design for applications involving tightly spaced configurations such as direct injection close to the core or inner injection



# Nozzle Overview

	Nozzle Ø (mm)	Type	Length (mm)	Medical/Pharma	Personal care	Thin-wall packaging	Caps and closures	Small parts	Technical parts
<b>MSS (Singledrop)</b>	MSN 16	STANDARD	79, 104, 129, 154	•		•	•		
	MSN 19	STANDARD	79, 104, 129, 154	•		•	•		
	MSN 22	STANDARD	79, 104, 129, 154	•		•	•		
	MSN 16	WEARPROOF	79, 104, 129, 154, 179	•		•	•		
	MSN 19	WEARPROOF	79, 104, 129, 154, 179, 204, 229, 254	•		•	•	•	
	MSN 22	WEARPROOF	79, 104, 129, 154, 179, 204, 229, 254			•	•		•
	MSN 16	SPECIAL EXEC.	79, 104, 129, 154	•	•			•	•
	MSN 19	SPECIAL EXEC.	79, 104, 129, 154	•	•				•
	MSN 22	SPECIAL EXEC.	79, 104, 129, 154, 179, 204, 229	•	•				•
	MCN 6,5	STANDARD	79, 104, 129, 154, 179, 204				•	•	
	MCN 8	WEARPROOF	79, 104, 129, 154, 179, 204				•	•	
	MCN 28	WEARPROOF	104, 129, 154, 179, 204, 229, 254, 279				•	•	
	MCN 34	WEARPROOF	104, 129, 154, 179, 204, 229, 254				•	•	
MCN-H 16	WEARPROOF	79, 104, 129, 154, 179, 204						•	
MCN-H 22	WEARPROOF	104, 129, 154, 179, 204, 229, 254, 279, 304, 329, 354, 379, 404						•	
MCN-P 22	STANDARD	79, 104, 129, 154, 179, 204, 229, 254, 279, 304, 329, 354, 379, 404			•				
<b>MMS (Multidrop)</b>	MMCN 6,5 M2	STANDARD	104, 129						•
	MMCN 6,5 M4	STANDARD	104, 129						•
	MMCN 8 M2	WEARPROOF	104, 129						•
	MMCN 8 M4	WEARPROOF	104, 129						•
	MMCN 16 M2	STANDARD	104, 129	•					
	MMCN 16 M2	WEARPROOF	104, 129				•	•	•
	MMCN 16 M2	SPECIAL EXEC.	104, 129	•	•			•	•
	MMCN 16 M4	STANDARD	104, 129	•					
	MMCN 16 M4	WEARPROOF	104, 129				•	•	•
MMCN 16 M4	SPECIAL EXEC.	104, 129	•	•			•	•	
<b>MES (Stack)</b>	MSN 19	STANDARD	79, 104, 129, 154	•		•			
	MSN 19	WEARPROOF	79, 104, 129, 154, 179, 204, 229, 254	•		•			
	MSN 19	SPECIAL EXEC.	79, 104, 129, 154	•	•				•
	MSN 22	STANDARD	79, 104, 129, 154	•		•			•
	MSN 22	WEARPROOF	79, 104, 129, 154, 179, 204, 229, 254	•		•			•
	MSN 22	SPECIAL EXEC.	79, 104, 129, 154, 179, 204, 229	•	•				•
<b>MZS (Central)</b>	MSN 16	STANDARD	79, 104, 129	•		•	•		
	MSN 16	WEARPROOF	79, 104, 129	•		•	•	•	•
	MSN 16	SPECIAL EXEC.	79, 104, 129	•	•			•	•
	MSN 19	STANDARD	79, 104, 129, 154	•		•	•		
	MSN 19	WEARPROOF	79, 104, 129, 154, 179, 204, 229, 254	•		•	•		•
	MSN 19	SPECIAL EXEC.	79, 104, 129, 154	•	•				•
	MSN 22	STANDARD	79, 104, 129, 154	•		•	•		
	MSN 22	WEARPROOF	79, 104, 129, 154, 179, 204, 229, 254	•	•				•
	MSN 22	SPECIAL EXEC.	79, 104, 129, 154, 179, 204, 229	•	•				•
	MCN 28	STANDARD	79, 104, 129, 154, 179, 204, 229, 254, 279				•	•	
	MCN 34	STANDARD	79, 104, 129, 154, 179, 204, 229, 254				•	•	
	MCN-H 16	WEARPROOF	79, 104, 129, 154, 179, 204						•
	MCN-H 22	WEARPROOF	79, 104, 129, 154, 179, 204, 229, 254, 279, 304, 329, 354, 379, 404						•
MCN-P 22	STANDARD	79, 104, 129, 154, 179, 204, 229, 254, 279, 304, 329, 354, 379, 404			•				

# Pin Actuation

We deliver your hot half with individually controlled pneumatic units or with a pin actuation plate equipped with a pneumatic or electrical drive depending on the application involved.

### Pneumatic individual drive

- > Proven and easy to maintain
- > High-speed needle opening allows faster cycle times

### Pneumatic plate actuation

- > Ideal for synchronized filling of high-cavitation molds

### Electrical plate actuation

- > Ideal for synchronized filling of high-cavitation molds
- > Customizable path profile
- > Variable positioning of pins

	Pneumatic individual	Pneumatic plate actuation	e-plate
Mold assembly height	+++	++	+
Maintenance	++	+++	+++
Procurement of replacement parts	+	+	+
Replacement part costs	++	++	+
Wear parts	+	+	++
Operating costs/electricity	++	++	+++
Complexity	++	++	+
Balance	+++	+++	+++
Opening and closing profile			+++
Variable pin positioning			+++
Tight nozzle pitch	++	+++	+++
Monitoring	+	++	+++

# männer e-plate

Electrically driven hot runner pin actuation plate

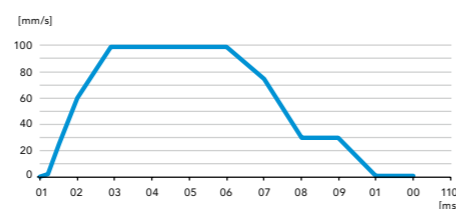
If your task is to accommodate a large number of cavities with tightly spaced injection points, the use of a pin actuation plate is the obvious choice. The e-plate solution offers a clean, synchronous solution while also enabling a customizable and controllable path profile.

- > Synchronous movement of all pins
- > Customizable path profile
- > Cleanroom-compatibility
- > All-electric and energy-efficient
- > High-precision pin positioning with männer e-control
- > With absolutely no play
- > Measuring system within motor. Rigid connection means 100% reliable pin monitoring
- > Driven by standard servo motor
- > Assembly height is similar to pneumatically driven pin actuation plate
- > Seal-off feature: Individual pin shut-off without any additional mold disassembly time allows
  - Production to continue
  - Without any machine downtime



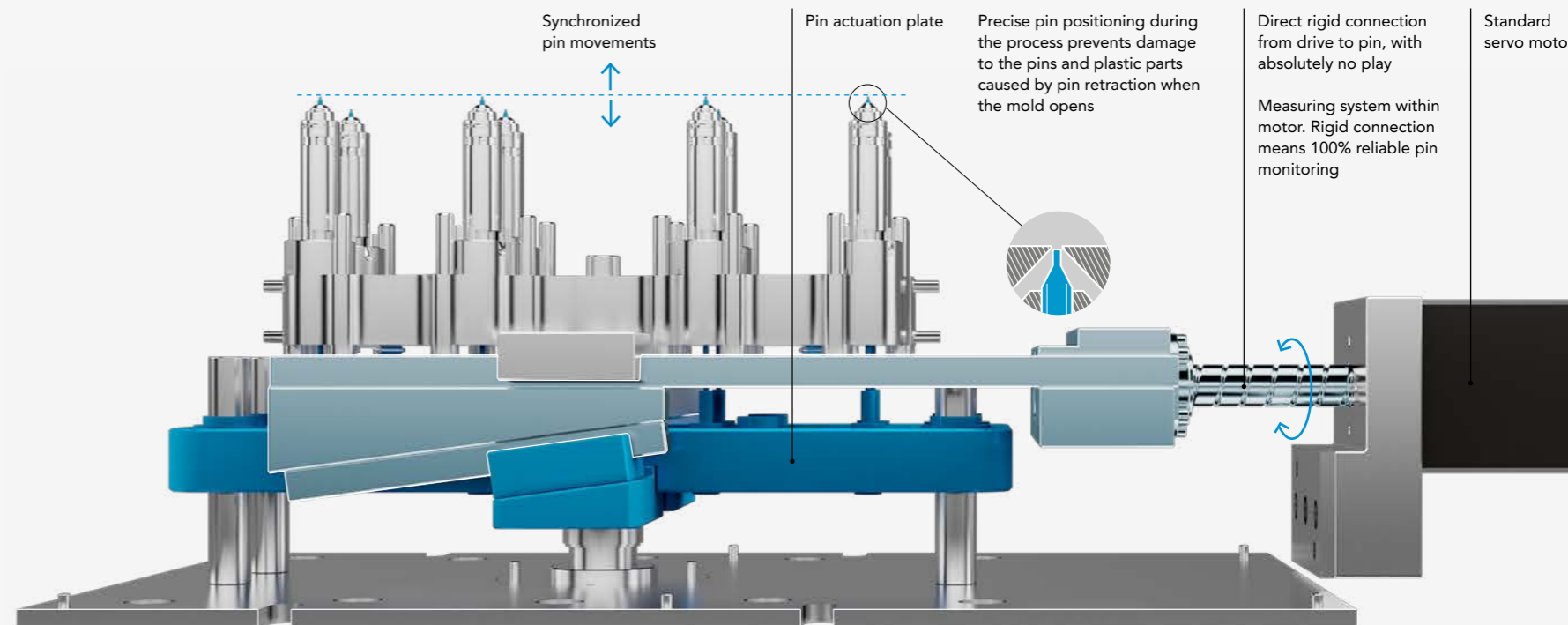
### männer e-control

- > High-precision pin positioning
- > Custom configuration of process parameters such as stroke length, travel speed, and timing of opening and closing
- > Enhanced process reliability due to automatic pin position monitoring and correction
- > Removable display
- > One control box for four electrical axes (slider, index plate, turntable, etc.)



### Customizable Path Profile

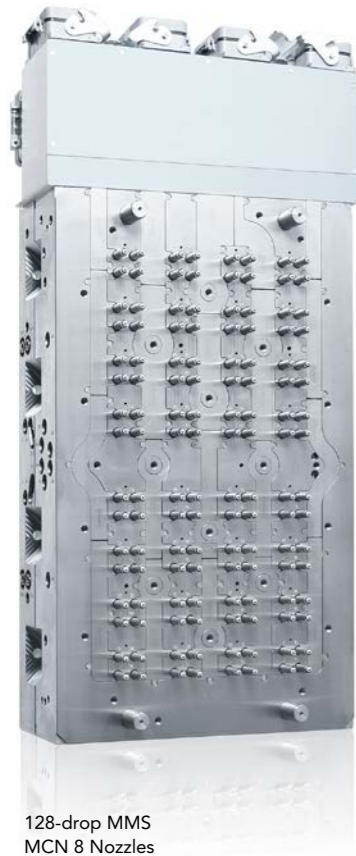
- > Pin motion can be modified to specific application requirements
- > Reduced wear on sprue during closing
- > Protection of pins and plastic parts by retracting pins when mold opens
- > Controlled positioning
- > Pin position can be adjusted in-process





# Hot Halves

We offer our customers fully assembled, wired, and tested hot halves, helping to reduce the time required for mold installation and lower costs. Our hot halves can be custom-designed according to customer specifications.



128-drop MMS  
MCN 8 Nozzles



64-drop e-plate MMS



192-drop MMS  
MCN 8 Nozzles



96-drop MSS  
MCN 6.5 Nozzles



64-drop MSS  
STANDARD Nozzles



## männer moldMIND III

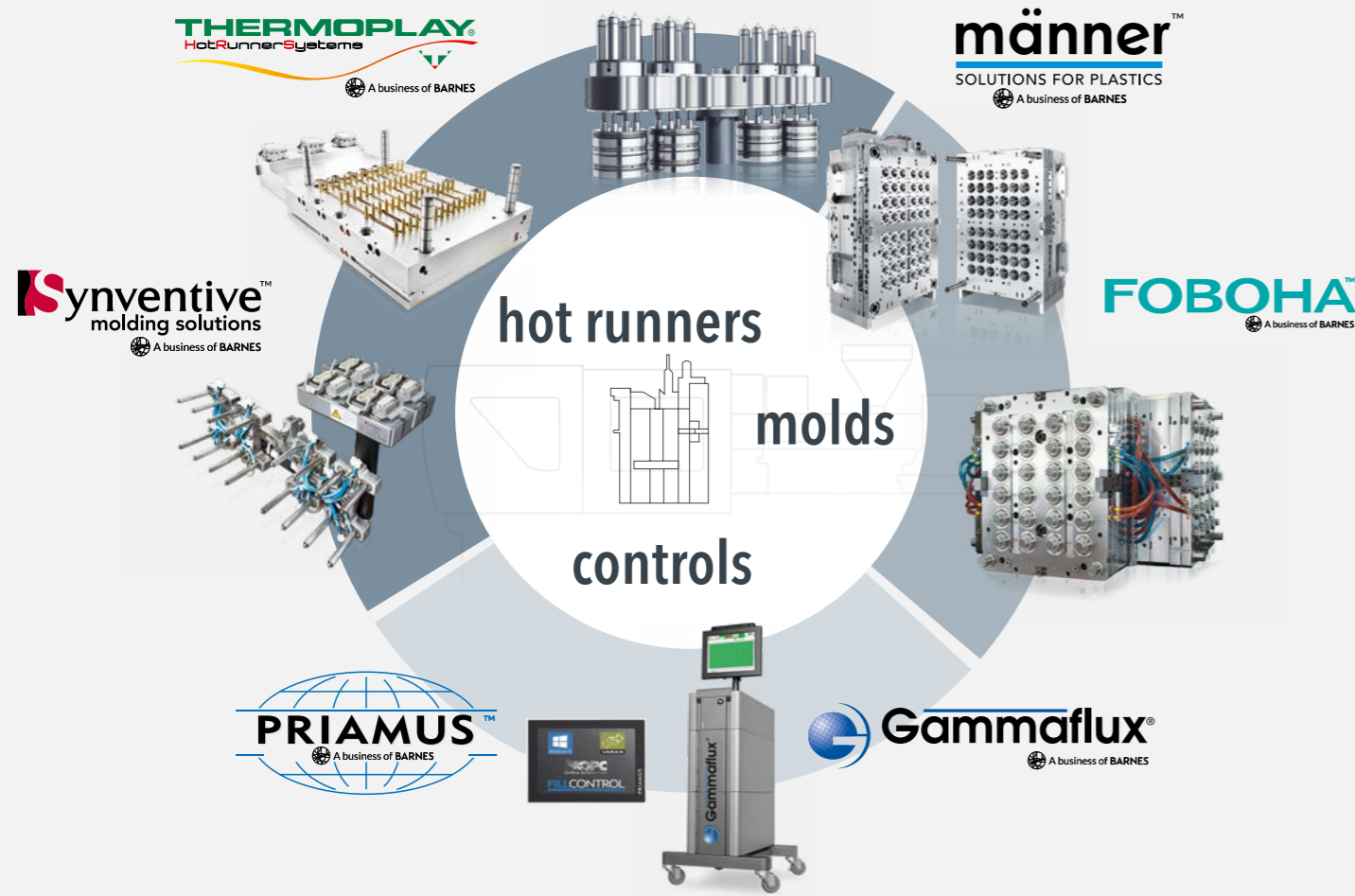
The digital cockpit for injection molds – for mold owners, injection molders and operators.

- › Monitoring and analysis of key process parameters during production
- › Real-time process data generated within the injection mold
- › Tamper-proof throughout the lifecycle of the mold
- › Central storage of comprehensive tool data and important documents and reports
- › Easy handling
- › Numerous interface and storage options
- › Cloud storage allows data to be accessed from anywhere in the world





MOLDING SOLUTIONS FAMILY



Plant I in Bahlingen: High Precision Molds

Plant II in Bahlingen: Hot Runner Systems

Plant III in Bahlingen

Plant IV in Au, Switzerland: High Precision Molds

Plant V: Manner USA, Inc.

Plant VI in Jiangsu: Barnes Molding Solutions

MÄNNER develops high-tech solutions for injection molding applications. We offer high-performance molds and customized hot runner technology for the production of plastic parts capable of meeting the most demanding requirements for precision and surface quality.

Founded in 1965, MÄNNER is among the industry's leading suppliers, with over 600 employees and production, sales, and service locations in Europe, the US, and Asia.

MÄNNER has been part of Barnes Group Inc. since 2013. For further information please visit [www.BGInc.com](http://www.BGInc.com)

The strategic Molding Solutions business unit of the Barnes Group is the world's only supplier able to combine know-how in technology for injection molds, hot runners, monitoring and control systems.

From prototype molds all the way to high-volume production molds, you benefit from our one-stop solutions. The focus is on carefully coordinated products and naturally balanced systems. This enables outstanding performance of the entire molding solution.

The global capacities of Moldings Solutions made possible by shared manufacturing sites in Europe, the Americas and Asia.



Headquarters in Bahlingen