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04/18 Technical specifications subject to change.

Valve Gate Hot Runner Systems

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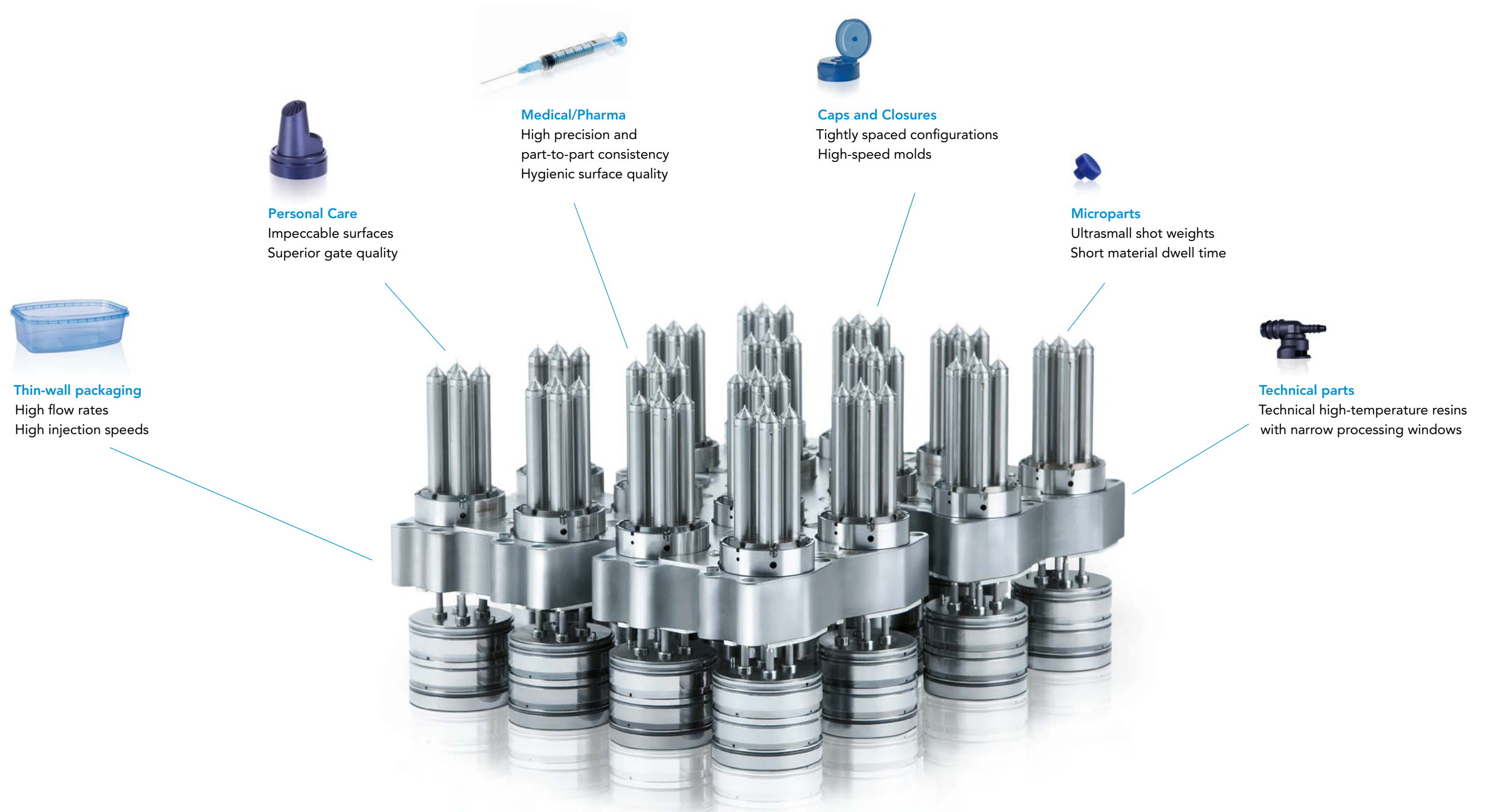
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Tailored Valve Gate Systems

Hot runner technology has a crucial impact on the 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 custom tailored and designed to meet the specific needs of our customers.

Valve Gate Hot Runner Systems



männer Valve Gates.
**High Precision and
 Part-to-Part Consistency**
Hygienic Surface Quality



Side injection of molded parts made of amorphous cyclic polyolefins (COC/COP).

Due to their tubular geometry, with long, narrow cores and an opening on both sides, syringe barrels require side gating. At the same time, the processability of COC/COP can make designing the molds and hot runners a tricky task. The EDGELINE® nozzle has been specifically developed to handle the high viscosity and temperature sensitivity of the polymeric materials. The nozzle ensures reliable processing and impeccable surface quality in the production of demanding pharmaceutical packaging.



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 stabile processing – so that you can produce reliably.



Insulin pen

Inhaler casing

Y-Connector

Petri dish

Break-open cap

Needle protector

Inhalors



System*	Nozzle design*
MSS (Singledrop)	STANDARD, SPECIAL, MCN-I
MMS (Multidrop)	STANDARD, SPECIAL
MES (Stack)	STANDARD, SPECIAL
EDGELINE®	

* Recommended systems and nozzle designs

männer Valve Gates.
Impeccable Surfaces
Superior Gate Quality



Personal Care

Consumers are picky. Cosmetic and personal care products must have an impeccable look and feel. Meanwhile, the use of resins containing Iridin 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.

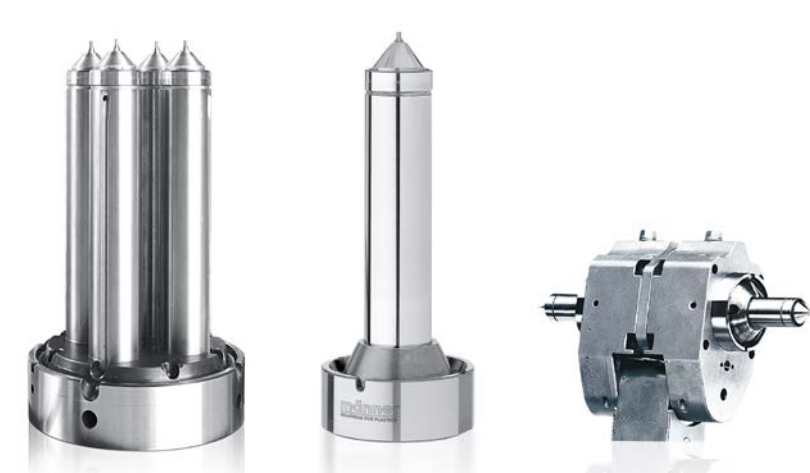


Pregnancy testing kit

Nozzle spray head

Spray head for deodorant

Contact lens packaging



System*	Nozzle design*
MSS (Singedrop)	SPECIAL
MMS (Multidrop)	SPECIAL
MES (Stack)	SPECIAL

* Recommended systems and nozzle designs

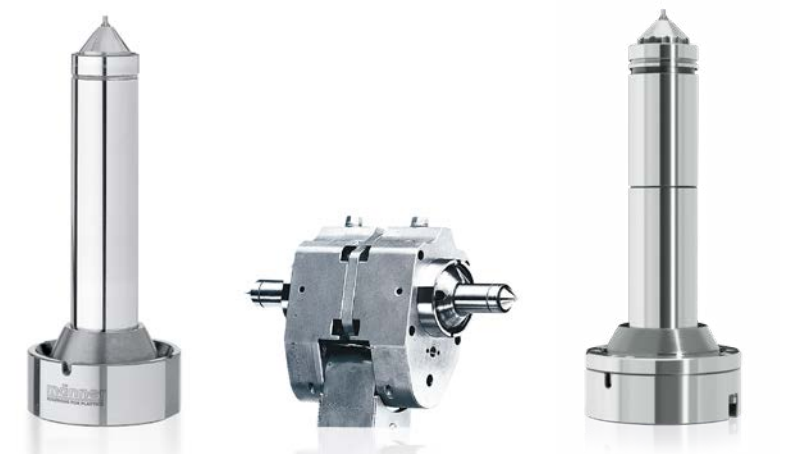
männer Valve Gates.
Maximum Flow Rates
High Injection Speeds

IML – In-Mold-Labeling.

The IML process involves inserting the label into the injection mold and injecting plastic from behind, making it possible to reduce wall thickness. Temperature control is the key to achieving impeccable results. männer valve gate hot runner systems enable virtually constant melt temperatures for the entire distance of flow. Nozzles are designed to maximize flow rates. The size of the gate orifice, meanwhile, depends on the application involved.

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 impacts results.



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

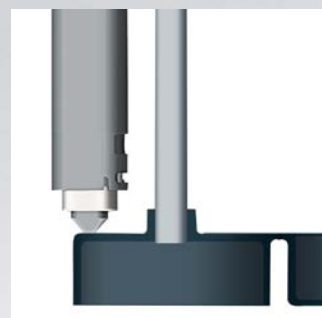
* Recommended systems and nozzle designs

männer Valve Gates.
Tightly Spaced Configurations
High-Speed Molds



Difficult spacing conditions.

Compact mold sizes, direct injection close to the core, or inner injection can mean less space for the hot runner system. männer's SLIMLINE is a slender nozzle with minimal space requirements that boasts an optimum temperature profile despite its intricate construction. The svelte nozzle is insulated by special high-tech ceramic, enabling delivery of a homogeneous temperature profile. The use of high-performance materials makes männer's SLIMLINE exceptionally resistant to pressure.



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.



System*	Nozzle design*
MSS (Single-drop)	SLIMLINE, STANDARD, WEARPROOF
MMS (Multidrop)	WEARPROOF
MES (Stack)	STANDARD, WEARPROOF

* Recommended systems and nozzle designs

männer Valve Gates.
Ultrasmall Shot Weights
Short Material Dwell Time



Microparts

When units are produced in large numbers, designing molds for small injection-molded parts with often demanding geometries can be a real 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 isolated from their working environment to ensure process reliability despite the tight spacing conditions. The design principle helps to shorten material dwell time within the system for gentle processing of the plastic.

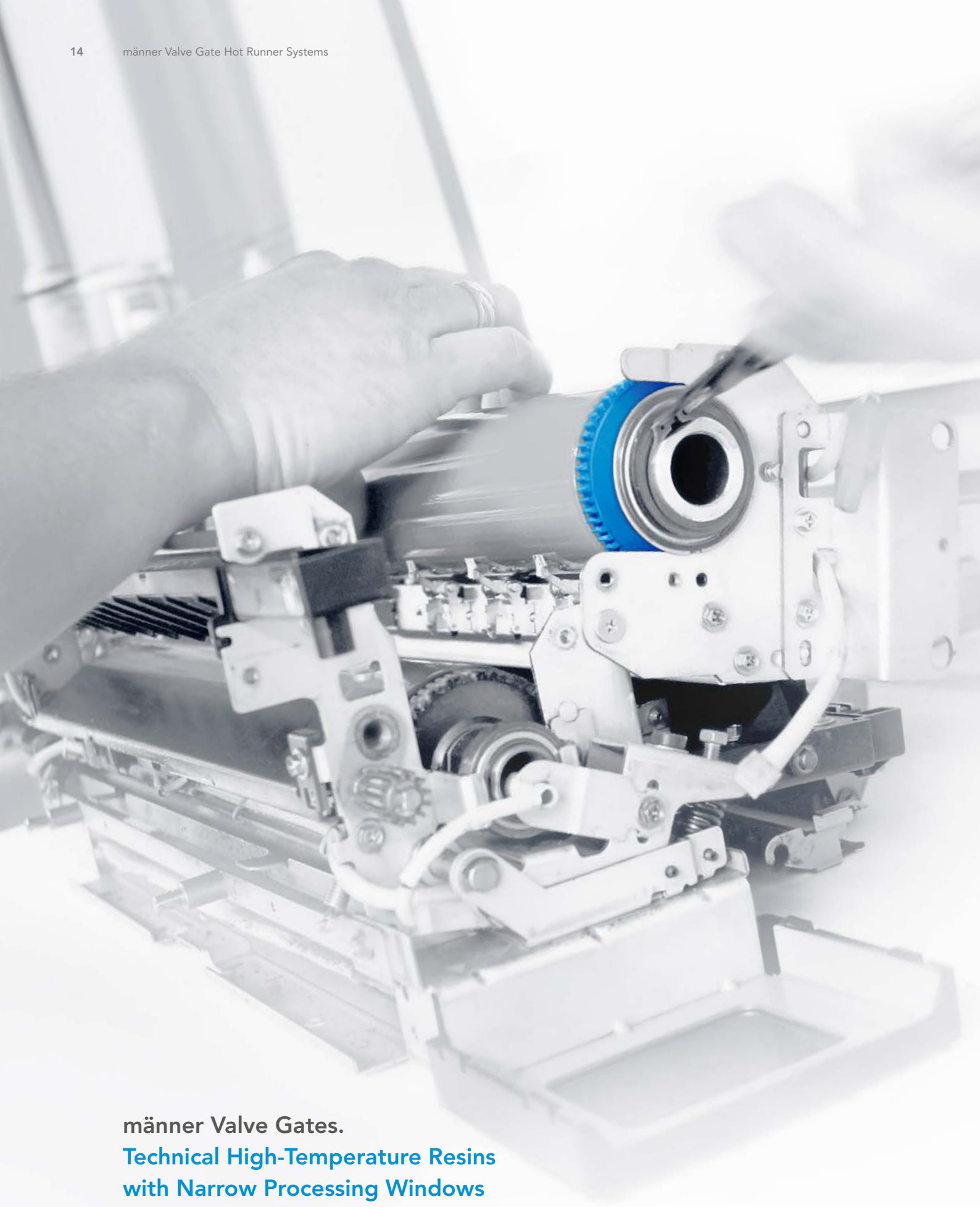


Pin Petrol filter Valve cap Pushbutton



System*	Nozzle design*
MSS (Singledrop)	SLIMLINE, WEARPROOF, SPECIAL, MCN-I
MMS (Multidrop)	SLIMLINE, WEARPROOF, SPECIAL

* Recommended systems and nozzle designs



männer Valve Gates.
**Technical High-Temperature Resins
 with Narrow Processing Windows**

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 having extremely narrow processing windows.



Tube connector



Piston



Pulley



Cartridge component



Dripper



Plug housing



System*	Nozzle design*
MSS (Singledrop)	WEARPROOF, SPECIAL, MCN-H
MMS (Multidrop)	WEARPROOF, SPECIAL
MES (Stack)	WEARPROOF, SPECIAL

* Recommended systems and nozzle designs

Nozzle Overview

Systems

MSS (Singledrop)

- › Large selection of nozzle designs for a wide range of applications
- › Custom manifold systems with 1 to 192 cavities
- › Nozzle designs SLIMLINE, STANDARD, SPECIAL, WEARPROOF, MCN-I, MCN-H



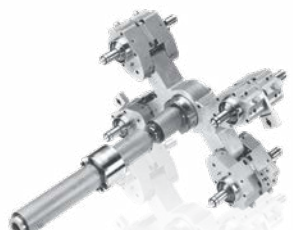
MMS (Multidrop)

- › 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 designs SLIMLINE, STANDARD, SPECIAL, WEARPROOF



MES (Stack)

- › A cost-effective solution for large-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 designs STANDARD, SPECIAL, 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 designs STANDARD, SPECIAL, WEARPROOF, MCN-I, MCN-H



EDGE LINE® (Lateral)

- › Side injection with the benefits of a Cylindrical Valve Gate
- › Direct side gating (no cold runner gating)
- › Ideal for long tubular parts



Nozzle designs

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



SLIMLINE

- › For close cavity spacing
- › Ideal for applications involving tightly spaced configurations such as direct injection close to the core or inner injection
- › For high-cavitation molds
- › For applications with extremely low part weights
- › Minimal space requirements
- › Special ceramic insulation for optimum temperature profile



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



SPECIAL (Special execution)

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



All systems are also available as hot halves.

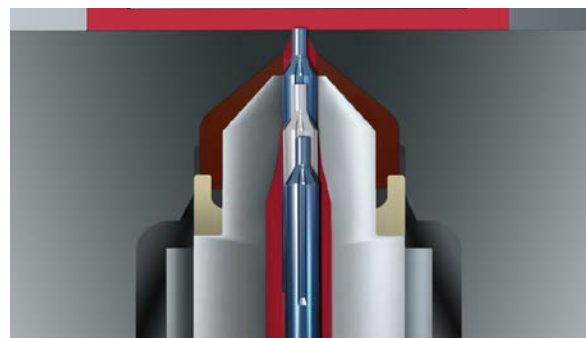
	Nozzle Ø (mm)	Type	Length (mm)	Medical/Pharma	Personal care	Thin-wall packaging	Caps and closures	Microparts	Technical parts
MSS (Singledrop)	8	SLIMLINE	79, 104, 129						
	16	STANDARD	79, 104, 129	•					
	19	STANDARD	79, 104, 129, 154	•					
	22	STANDARD	79, 104, 129, 154, 179, 204, 229, 254	•					
	16	WEARPROOF	79, 104, 129			•	•	•	•
	19	WEARPROOF	79, 104, 129, 154			•	•	•	•
	22	WEARPROOF	79, 104, 129, 154, 179, 204, 229, 254			•	•	•	•
	16	SPECIAL	79, 104, 129	•	•				•
	19	SPECIAL	79, 104, 129, 154	•	•				•
	22	SPECIAL	79, 104, 129, 154	•	•				•
MMS (Multidrop)	16	MCN-I	79, 104, 129, 154, 179, 204	•*				•*	
	16	MCN-H	79, 104, 129, 154, 179, 204						•
	22	MCN-H	104, 129, 154, 179, 204						•
	22	MCN-P	79, 104, 129, 154, 179, 204, 229, 254, 279, 304, 329, 354, 379, 404			•			
MES (Stack)	19, 22	STANDARD	79, 104, 129	•		•			
	19, 22	WEARPROOF	79, 104, 129			•			•
	19, 22	SPECIAL	79, 104, 129, 154	•	•				•
MZS (Central)	16	STANDARD	79, 104, 129	•		•	•		
	19	STANDARD	79, 104, 129, 154	•		•	•		
	22	STANDARD	79, 104, 129, 154, 179, 204	•		•	•		
	28	STANDARD	79, 104, 129, 154, 179, 204, 229, 254			•	•		
	34	STANDARD	79, 104, 129, 154, 179, 204, 229, 254			•	•		
	16	WEARPROOF	79, 104, 129			•	•	•	•
	19	WEARPROOF	79, 104, 129, 154			•	•	•	•
22	WEARPROOF	79, 104, 129, 154, 179, 204			•	•	•	•	
EDGE LINE® (Lateral)	16	SPECIAL	79, 104, 129	•	•			•	•
	19	SPECIAL	79, 104, 129, 154	•	•			•	•
	22	SPECIAL	79, 104, 129, 154	•	•			•	•
	16	MCN-I	79, 104, 129, 154, 179, 204	•*				•*	
	16	MCN-H	79, 104, 129, 154, 179, 204						•
	22	MCN-H	104, 129, 154, 179, 204						•

*Amorphous resins

Resin examples

Medical	PC, COC, COP, PS, ABS, PMMA, POM, PBT, TPE-S, TPE-O, TPE-U, TPE-V
Personal Care	ABS, PC, PC/ABS, SAN, PS, PET, PET-G, PCT-G, TPE-S, TPE-O, TPE-U
Thin-wall	Polyolefins (MFI 40-100), PP, PE, PE-LD, PE-HD
Caps and Closures	Polyolefins (MFI 5-80), PP, PE, PE-LD, PE-HD, PET, PET-G, PCT-G
Microparts	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
Technical parts	Polyolefins PP, PE (reinforced), PMMA, PC, PC/ABS, ABS, PBT, PA (PA6, PA66, PA46, etc.), PPE, PPS, PET, PET-G, PCT-G

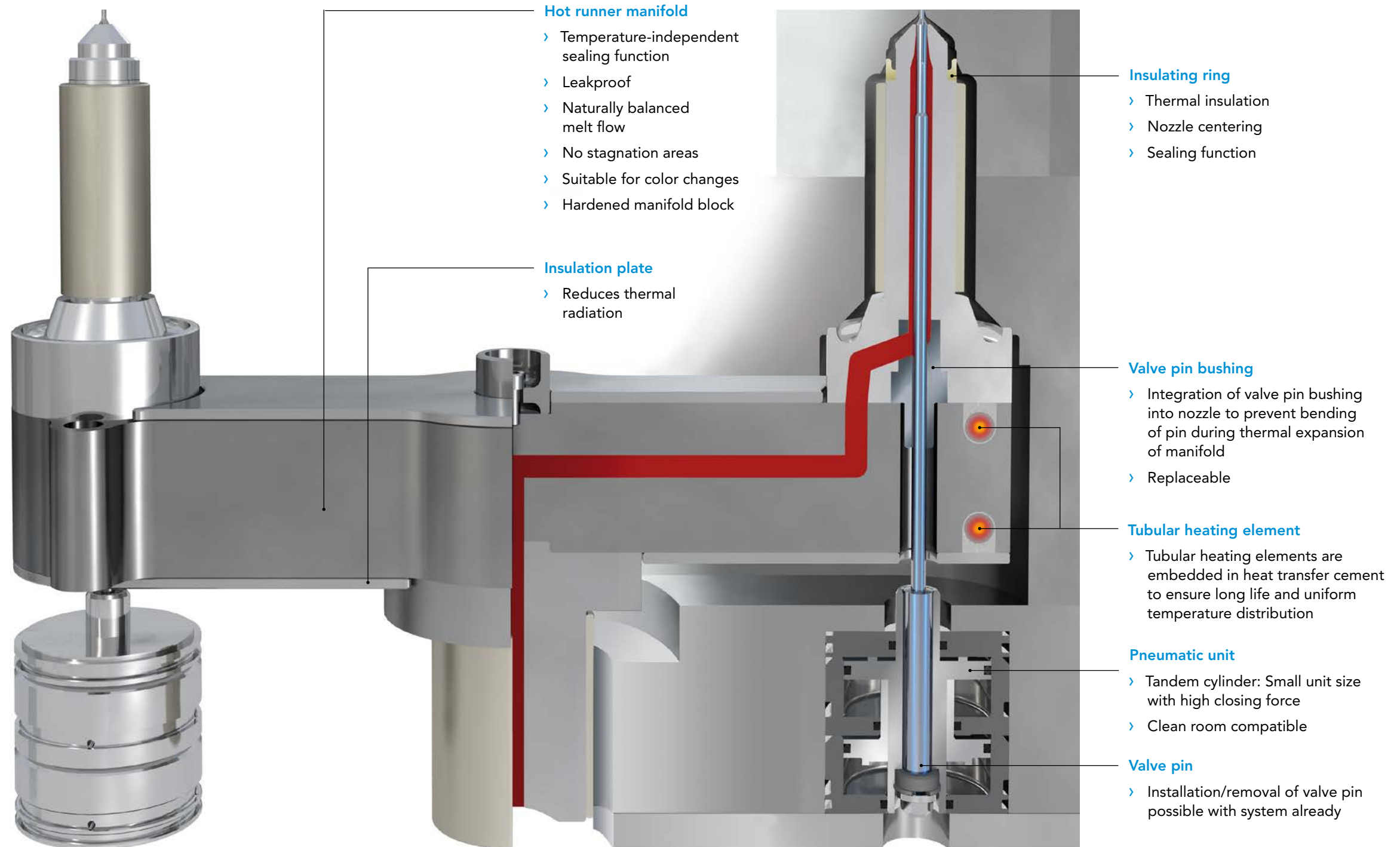
Cylindrical Valve Gate – the Original by männer



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 long life.

- > Superior gate quality
- > Large gate cross section
- > Minimal pressure drop
- > Low shear rates
- > Long life with minimal wear and low 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)





128-cavity MMS SLIMLINE



32-cavity MMS SLIMLINE

Valve pin drive: individual or plate-actuated

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

Pneumatic individual drive

- > Proven and easy to maintain
- > High-speed opening of the pins positively impacts the cycle time

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	Electrical plate actuation
Mold assembly height	+	o	-
Acquisition costs	+	o	-
Maintenance	+	o	o
Procurement of replacement parts	+	o	-
Replacement part costs	+	+	-
Operating costs/electricity	o	o	+
Complexity	+	+	-
Shut-off capabilities	+	-	-
Balance	+	+	+
Opening- and closing profile	-	-	+
Variable pin positioning	o	o	+
Tight nozzle pitch	o	+	+
Cycle time	+	o	o

+ positive o neutral - not optimum

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.



64-cavity MSS Standard System



32-cavity MMS multiple drop system



4 + 4-cavity MES Stack System

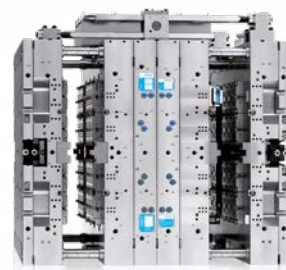


2-component MES Stack System

Valve Gate Hot Runner 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.



High-Precision Molds

männer high-precision molds are extremely durable, high-performance molds specifically designed for high-volume manufacturing of precision injection-molded parts. We develop our high-precision molds with a clear focus on part-to-part consistency and reproducibility, which are essential to automated downstream processing of the injection-molded parts.

For Better Results

Reliability and cost-effectiveness in production:

- › Perfectly coordinated components
- › Extensive engineering know-how
- › Dedicated contact person for your project



Hot runner temperature control system

Precise temperature management

High-precision, easy-to-use Gammaflux control technology supports finely graduated temperature control in männer hot runner valve gate systems.



moldMIND®

The digital cockpit of the mold

männer moldMIND® II records real-time process data generated in the injection mold while ruling out any possibility of data tampering. moldMIND® II can also activate alarm signals when critical values are reached. A reminder function supports preventive maintenance measures. Collected data can also be deployed with a moldMIND® cloud solution. The smart device is used to monitor and analyze key parameters in the production process for optimizing costs and increasing productivity.



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 Jiansu: 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 500 employees and production, sales, and service locations in Europe, the US, and Asia.

Since 2013 männer is part of Barnes Group Inc. For further information please visit www.BGInc.com



Molding Solutions, a strategic business unit of Barnes Group Inc., provides high quality hot runners, molds and control systems to demanding global customers in the injection molding industry.

