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
- **Thin Wall Packaging**: High flow rates, High injection speeds
- **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
- **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. MANNER’s original valve gate delivers virtually noncontact injection points for hygienic surface quality and stable processing – enabling consistent, reliable production.

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<tr>
<th>System*</th>
<th>Nozzle design*</th>
<th>Resin examples</th>
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<tr>
<td>MSS (Singledrop)</td>
<td>SLIMLINE, SPECIAL, MCN-CC (Caps &amp; Closures)</td>
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* Recommended systems and nozzle designs
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.

System* Nozzle design* Resin examples
MSS (Singledrop) STANDARD, WEARPROOF Polyolefins (MFI 40-100), PP, PE, PE-LD, PE-HD
MSS (Stacks) STANDARD, WEARPROOF

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

* Recommended systems and nozzle designs
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 isolated 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.

### Small 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.

### Technical 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 isolated 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.

### Resin examples

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<td>Polyolefine PP, PE (reinforced/unreinforced), PC, PBT, PA (PA6, PA66, etc.), ABS, PS, PC, PMMA, PET, PET-G, PCT-G, TPE-U, TPE-U</td>
</tr>
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<td>MMS (Multidrop)</td>
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<td></td>
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<tr>
<td>MES (Stacked)</td>
<td>WEARPROOF, SPECIAL, MCN-H</td>
<td>Polyolefine PP, PE (reinforced), PMMA, PC, PBT, PA (PA6, PA66, PA46, etc.), ABS, PPS, PBT, PET, PET-G, PCT-G</td>
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* Recommended systems and nozzle designs
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)

Hot runner manifold
- Temperature-independent sealing function
- Leakproof
- Naturally balanced melt flow
- No stagnation areas
- Suitable for color changes
- Hardened manifold block

Insulating ring
- Thermal insulation
- Nozzle centering
- Sealing function

Insulation plate
- Reduces thermal radiation

Valve pin bushing
- Integration of valve pin bushing into nozzle to prevent bending of pin during thermal expansion of manifold
- Replaceable

Tubular heating element
- Tubular heating elements are embedded in heat transfer cement to ensure long life and uniform temperature distribution

Pneumatic unit
- Tandem cylinder: Small unit size with high closing force
- Cleanroom compatible

Valve pin
- Installation/removal of valve pin already possible with system
### Systems and Nozzle Designs

#### Nozzle Overview

<table>
<thead>
<tr>
<th>Nozzle Ø (mm)</th>
<th>Type</th>
<th>Length (mm)</th>
</tr>
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<tbody>
<tr>
<td>6.5</td>
<td>SLIMLINE</td>
<td>79, 104, 154, 179, 204</td>
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<tr>
<td>8</td>
<td>SLIMLINE</td>
<td>79, 104, 154, 179, 204</td>
</tr>
<tr>
<td>16</td>
<td>STANDARD</td>
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<tr>
<td>22</td>
<td>STANDARD</td>
<td>79, 104, 154, 179, 204, 229, 254</td>
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<td>16</td>
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#### 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

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

**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

**MCN - münner 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 semicrystalline 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

### Systems

**MSS (Single-drop)**
- 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, MCN-CC

**MZS (Central)**
- 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 high-volume production
- Opposing injection points lie on a single axis
- Double the output with the same closing force
- Split-annulus 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

**MMS (Multidrop)**
- Ideal for applications with tightly spaced cavities
- For processing parts with large areas
- Valve gate technology MCN-H, MCN-P , MCN-CC
- Special calotte design for applications requiring superior surface quality and for polyester
- For processing lightweight parts
- Minimal space requirements

**EDGELINE (Lateral)**
- Side injection with the benefits of a cylindrical valve gate
- Direct side gating (no cold runner gating)
- Ideal for long tubular parts

**All systems are also available as hot halves.**
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
- Customizable path profile
- Variable positioning of pins

**Electrical plate actuation**
- Ideal for synchronized filling of high-cavitation molds
- Customizable path profile

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

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männer Valve Gate Hot Runner Systems

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männer EDGELINE

1-Point, 2-Point, and 4-Point Hot Runner Valve Gate Nozzle for Side Injection

Due to their tubular geometry with long, narrow cores and an opening on both sides, syringe barrels require side gating. Most notably, EDGELINE is ideal for processing glass substitutes such as COC or COP, which are used in the production of prefillable syringes.

- Side injection with all the benefits of the cylindrical valve gate: defined pin opening and closing, impeccable gate quality, high process reliability and repeatability
- Suitable for a wide range of resins (polyolefins, COC/COP, PMMA, PA, PC, TPE, and many more)
- Homogeneous temperature profile even when processing resins with narrow processing windows
- Insulating ring made of highly thermally insulating material
- Each nozzle tip can be heated separately

Nozzle layout enables compact mold design
männer Combi Nozzles

Basic body is combined with a custom nozzle tip

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

männer SLIMLINE

For tight cavity spacing in high-cavitation molds

› Applications with tight spacing conditions such as direct injection close to the core or inner injection
› Stable nozzle design made possible by stronger nozzle tube with no change to installation dimensions
› Includes extra valve pin guide ring
› Excellent thermal separation of the nozzles from the mold using specially integrated components
› Easy maintenance

SLIMLINE 8
Nozzle tip with insulating ring made of highly thermally insulating material for processing engineered resins with narrow processing windows

SLIMLINE 8
Nozzle tip with insulating ring made of robust steel material for processing polyolefine

SLIMLINE 6.5
Nozzle tip design for tightly spaced configurations at the sprue bushing for processing polyolefines

männer moldMIND II

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

männer Valve Gate Hot Runner Systems
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.
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.

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