

Mustang™ E

CHROMATOGRAPHY CAPSULES

High-throughput single-use capsules for endotoxin removal

Mustang™ E high-throughput single-use filter capsules are designed for endotoxin removal from buffers, water, salt solutions, process streams, or more complex solutions by means of hydrophobic charge interaction.

Endotoxins are complex negatively charged lipopolysaccharides coming from the cell wall of gram-negative bacteria such as *E. coli*. Our charged Posidyne™ filter membranes efficiently remove endotoxins, particularly in water, but Mustang E capsules allow the retention of endotoxins from solutions with high-salt content over an extended pH range.

High capacity for endotoxin removal from buffers, water and saline solution – In certain cases, Mustang E membrane is also efficient for the removal of endotoxins from biological fluids such as proteins, sugars, or vaccines. Mustang E membrane is a positively charged polyethersulfone (PES) membrane with high dynamic binding capacity for endotoxins.

Each Mustang E capsule contains three layers of pleated membrane with approximately 200 nm pore size. The capsules are designed to be single use to eliminate cleaning and cleaning validation. They are available in a single-use capsule format to accommodate the range of flow and capacity requirements used in biopharmaceutical processes. The three-layer construction is consistent from the laboratory Acrodisc™ capsule (0.12 mL) to process-scale capsules. The ease of linear scale-up enables a shortened development time.



Fig 1. Mustang E chromatography capsule range.

Features and benefits

- Binding efficiency – Endotoxins are readily bound in a single pass.
- Speed – High flow rates enable the processing of large volumes in short time scales.
- Scalability – A range of sizes accommodate different batch volumes and process capacities.
- Convenience – Ready to use and autoclavable.
- Flexibility – Available in capsule format.

Endotoxin removal efficiency

Mustang E capsules have been shown to bind more than 4×10^6 EU/mL of membrane. The presence of proteins or other biological compounds, and the flow rates used may influence test sensitivity, efficiency of binding, and capacity. Performance capability in a specific solution must be determined and validated by the user.

For more information, contact us.

High quality standards

- Manufactured to high quality assurance standards in accordance with ISO 9000.
- Membrane lots tested for endotoxin binding capacity.
- Mustang E capsules are identified by a lot number and a unique serial number for traceability of manufacturing history, satisfying stringent QC/QA requirements.
- Supplied with certificate of analysis to confirm quality and quality control.
- Meets USP biological reactivity tests *in vivo* in accordance with USP Class VI plastics at 50°C.

Comprehensive validation

- Extensive validation to ensure consistent and reliable performance.

Technical specifications

Material of construction

	Novasip™ capsule CLxMSTGEP1⁽⁴⁾	Kleenpak™ Nova capsule NPxMSTGEP1⁽⁴⁾
Membrane	Modified hydrophilic polyethersulfone	Modified hydrophilic polyethersulfone
Membrane support and drainage layer assembly	Polypropylene	Polypropylene
Endcaps, core and cage	Polypropylene	Polypropylene
Housing bowl	Polyetherimide	Polypropylene
Housing head	Polyetherimide with TiO ₂	Polypropylene with TiO ₂
O-rings	Silicone elastomer	Silicone elastomer

⁽⁴⁾ For CLxMSTGEP1 X = M05 for a unit with a bed volume of 10 mL, 3 for a unit with a bed volume of 40 mL. For NPxMSTGEP1, X = 6 for a unit with a bed volume of 160 mL, 7 for a unit with a bed volume of 320 mL, 8 for a unit with a bed volume of 480 mL.

Capsules operating characteristics ⁽¹⁾

Maximum operating pressure	3.0 bar (43.5 psi) at 40°C (104°F)
Maximum differential pressure	3.0 bar (43.5 psi) at 40°C (104°F)
Maximum sanitization conditions	1 M NaOH for 30 min for one cycle only
Maximum autoclave conditions	121°C (250°F) for 30 min for one cycle only

⁽¹⁾ With fully compatible fluids that do not soften, swell or adversely affect the capsule or its materials of construction.

Typical dynamic binding capacity

Endotoxin binding capacity ⁽²⁾ 4×10^6 EU / mL of membrane volume

⁽²⁾ Tested with LPS from *E. coli* in saline.

Typical flow rates vs. Delta P (pressure drop) for Mustang E capsules are shown in Figure 2.

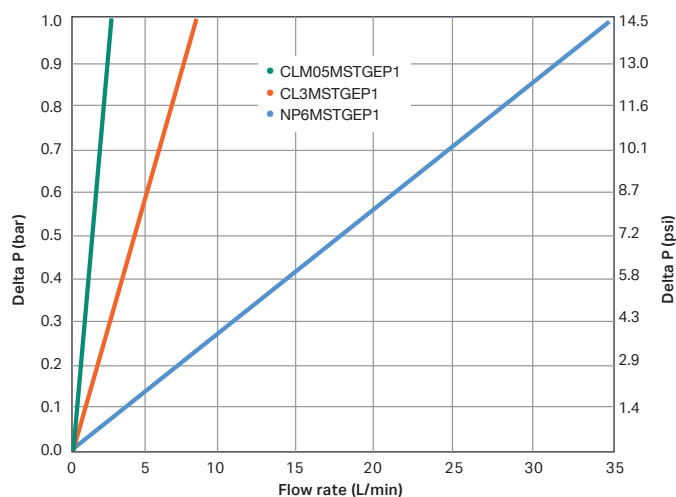


Fig 2. Typical flow rates vs. Delta P (pressure drop) for three Mustang E filter capsules. Flow rate determined at 20°C (±2°C) at 1 cP on an unused unit in 10 mM MES buffer at pH 5.5.⁽³⁾

⁽³⁾ For assistance in sizing, contact us.

Nominal dimensions for capsules

Capsule type	CLM05MSTGEP1	CL3MSTGEP1	NP6MPSTGEP1	NP7MSTGEP1	NP8MSTGEP1
Maximum diameter including valves	123 mm (4.8 in.)	123 mm (4.8 in.)	154 mm (6.1 in.)	154 mm (6.1 in.)	154 mm (6.1 in.)
Length with 38 mm (1½ in.) sanitary flange	84 mm (3.3 in.)	157 mm (6.2 in.)	333 mm (13.1 in.)	581 mm (22.9 in.)	831 mm (32.7 in.)
Bed volume	10 mL	40 mL	160 mL	320 mL	480 mL

Ordering information

Product	Packaging	Product code
Mustang E capsule, 10 mL, connections 38 mm (1½ in.) sanitary flange	1/box	CLM05MSTGEP1
Mustang E capsule, 40 mL, connections 38 mm (1½ in.) sanitary flange	1/box	CL3MSTGEP1
Mustang E capsule, 160 mL, connections 38 mm (1½ in.) sanitary flange	1/box	NP6MSTGEP1
Mustang E capsule, 320 mL, connections 38 mm (1½ in.) sanitary flange	1/box	NP7MSTGEP1
Mustang E capsule, 480 mL, connections 38 mm (1½ in.) sanitary flange	1/box	NP8MSTGEP1

cytiva.com

Cytiva and the Drop logo are trademarks of Life Sciences IP Holdings Corporation or an affiliate doing business as Cytiva.

Acrodisc, Kleenpak, Mustang, Novasip and Posidyne are trademarks of Global Life Sciences Solutions USA LLC or an affiliate doing business as Cytiva.

Any third-party trademarks are the property of their respective owners.

© 2023 Cytiva

For local office contact information, visit cytiva.com/contact

CY40879-06Dec23-DF

