



Single-Use Bioprocessing Systems Portfolio & Capabilities

Standard, configured-to-order and
engineered-to-order options.



About Masterflex®

Avantor® delivers complete fluid handling solutions, from pumps and components to configurable assemblies and engineered systems, under the Masterflex™ brand, supporting your process from R&D to high-volume manufacturing.

Fluid Management Systems

For over 30 years, our Fluid Management Systems Team, has been serving global biopharma and CDMO companies with single-use (SU) bioprocessing systems, consumables and assemblies.

All our systems are specifically designed to maximize your biomanufacturing production while ensuring product contamination protection in all aspects of your operations, including:

- Mixing
- Filtration
- Buffer and media preparation
- Storage and transportation

We offer flexible options designed to address simple and complex operations according to your requirements:

- Standard systems and SU consumables
- Configured-to-order (CTO) solutions with a large range of selectable options
- Engineered-to-order (ETO) customized systems tailored to your unique needs

Single-Use Mixing Systems

Scalable mixing for solid-liquid or liquid-liquid applications

Magnetic Mixer



Powerful, low-shear aseptic mixing, facilitated by magnetic forces driving a free-floating SU impeller.

- Compact and mobile design
- Scalable mixing from 1 to 1,500 L in standard configurations
- ETO options available up to 2,500 L

Top Mixer



An open-top SU mixer for bulk production of less sensitive materials such as buffers.

- Scalable mixing from 5 to 560 L in standard configurations
- ETO systems available up to 3,000 L
- Compatible with the full Avantor® suite of SU solutions, including tank liners and other accessories

Quattro Mixer



Cost-effective aseptic mixing powered by recirculation through a SU fluid pathway generated by a stand-alone pump.

- SU mixing head with 16 nozzles
- Scalable mixing from 5 to 500 L in standard configurations
- Support vessels available in plastic or stainless steel

Configurable options

Standard and CTO options:

- Load cells
- Bag inflation system
- Double-jacketed vessels for temperature control
- Integrated SU sensors: pH, conductivity and DO

Standard models:

- Load cells
- TopMixer 200 – drum size from 50 to 200 L
- TopMixer 500 – drum size from 200 to 560 L
- Two types of metallic impellers for liquid-powder or liquid-liquid mixing applications

Standard and CTO options:

- Load cells
- Bag inflation system
- Double-jacketed vessels for temperature control
- Inline SU sensors: pressure, conductivity, flow, temperature and pH

Fluid Transfer and Filtration Systems

Scalable ETO options for filtration and fluid handling

Tangential flow filtration systems



Tangential flow filtration (TFF) systems for ultrafiltration, diafiltration, purification and concentration

- Recirculation flowrates supported from 700 to 5000 L/hr
- Permeate flowrates supported from 12 to 300 L/hr
- Hollow fiber or stack cassette filter styles supported with membrane areas from 0.01 to 10.0 m²
- Modular automation software supporting numerous unit operations: concentration, diafiltration, recirculation and/or WFI rinse

Pump skids



Fully integrated pump skid for advanced control fluid transfer

- Ergonomic design including one controller for all functions
- Integrated formulation programming for automated pumping

Configurable options

- Temperature and/or weight controlled
- Permeate/retentate hold up container or on-board mixing vessels
- Inline SU sensor process and quality control options: pressure, flow, temperature conductivity, pH, UV/turbidity and bubble detection
- Different types of pump heads: peristaltic, diaphragm pump and centrifugal
- Assorted inline SU sensors for process control: pressure, flow, temperature conductivity, UV/turbidity and bubble detection and/or pH

Inline Buffer Preparation Systems

ETO systems for inline mixing or on-demand buffer/media preparation to support upstream and downstream unit operations



Inline Dilution: For diluting concentrated buffer solutions with water to achieve the desired buffer concentration

Inline Conditioning: For mixing individual buffer stock components (e.g., acids, bases, salts) and water to create the final buffer solution

Inline Mixing: For inline static mixing or surge vessel mixing with SU mixing cells. Potential applications: cell lysis, viral inactivation and others

Configurable options

- Weight and flow measurement for volume and process control
- Passive or active mixing options
- Assorted inline SU sensors for process control: pressure, flow, temperature conductivity, UV/turbidity, bubble detection and/or pH

Storage and Transportation Containers

Plastic 3D bag support containers



- Plastic containers that can be collapsed for easy storage, handling and shipping
- Standard sizes: 200, 500 and 1,000 L
- ETO support containers available up to 2,500 L
- ISTA certified for shipping

Stainless-steel 3D bag support containers



- Transport style in 200, 500 and 1,000 L sizes while cleanroom style comes in 50, 200, 500, 1,000 and 1,500 L sizes
- ETO systems available up to 2,500 L
- ISTA certified for shipping

Transport and handling accessories



- Wheeled dollies
- Pushbar trollies

Configurable options

- Cleanroom castered wheels
- Bag hoist assist
- Light blocking
- Cleanroom compatible

- Double-jacketed vessels for temperature control
- Cleanroom castered wheels
- Load cells
- Bag inflation
- Bag hoist assist
- Light blocking
- Leak proof
- Cleanroom compatible

- Cleanroom castered wheels
- Load cells

Single-Use Bags and Assemblies

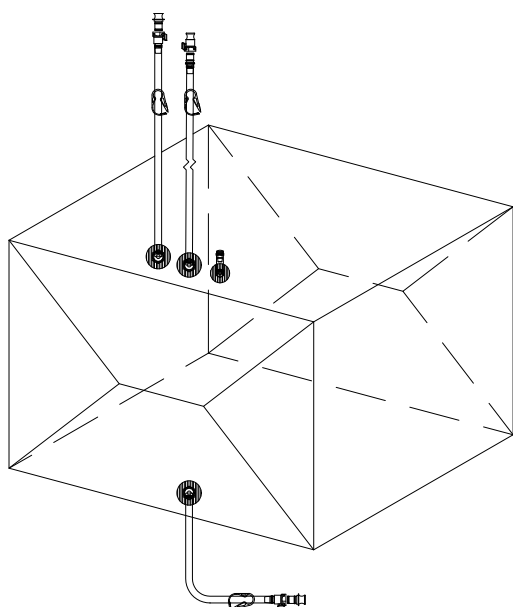
Masterflex single use bags and assemblies are available as standard, CTO and ETO options. Compatible with the full suite of Masterflex single-use systems, they can be tailored to meet your process requirements.

Mixing and storage/transportation SU bags:

- Multilayered film composed of:
 - Inert ULDPE contact layer
 - Gas and moisture vapor barrier layer
 - Durable polyethylene (PE) outer layer
- Same materials and connections across different sizes and scale
- Standard 3D cubic bags with 3 top ports and 1 drain port

ETO bioprocessing SU bag assemblies

- Fully customizable designs
- Leveraging Avantor's extensive component library (over 14,000 parts), including SU bags, bottles, tubing, filters, connectors, etc.
- Brand-agnostic design approach, selecting components from different vendors based on fit-for-purpose or lead time



AVAILABLE SIZES:

50 L	500 L
100 L	1000 L
200 L	1500 L

Outer layer

PE	50 µm
Tie	10 µm
EVOH	20 µm
Tie	10 µm
ULDPE	230 µm

Contact layer

3 STANDARD CHAMBER VERSIONS FOR EACH SIZE:

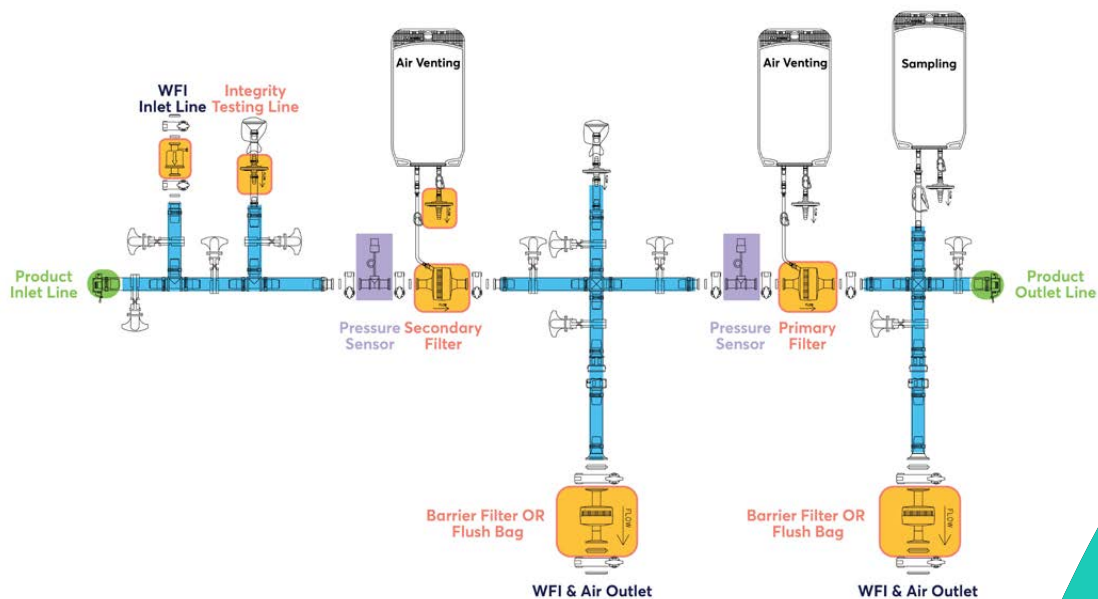
Powder port
pH sensor
Conductivity sensor

PUPSIT Assemblies

Configurable assemblies to support pre-use post-sterilization integrity testing

Pre-use post-sterilization integrity testing (PUPSIT) helps confirm sterilizing filter integrity before product filtration, supporting alignment with EU GMP Annex 1. Masterflex® PUPSIT assemblies help simplify assembly development through configurable, pre-designed options and a supplier-agnostic approach.

Our broad library of validated components supports flexible adaptation to your process requirements and can help reduce lead times compared with fully customized solutions.



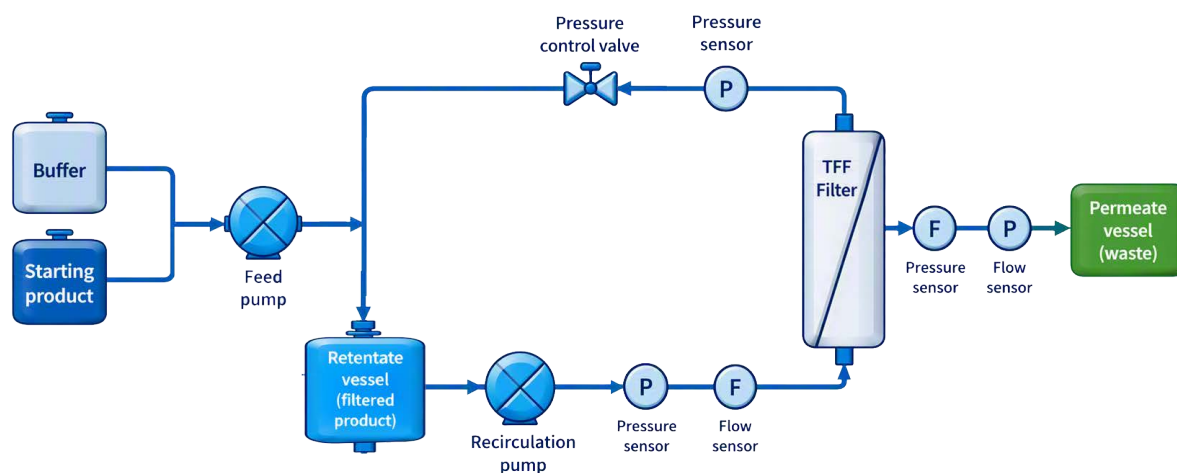
Configurable options:

- **Filters:** Air, liquid and barrier filtration
- **Sensors:** Inline pressure sensors or single-use gauge tees
- **Aseptic fittings:** Connectors, disconnectors and sampling ports
- **Tubing:** Regular or reinforced silicone or TPE tubing

TFF Assemblies

Standard, configurable and custom flowpaths for tangential flow filtration

Masterflex® TFF assemblies and flowkits provide configurable flowpaths before and after the TFF filter. Designed for ultrafiltration, diafiltration, purification and concentration, they can be configured with different filter formats and components to meet your process needs.



Configurable options:

- **Flowpaths:** Feed, retentate and permeate tubing sets for pre- and post-TFF applications
- **Filter formats:** Hollow fiber or stack cassette filters
- **Fluid handling components:** Reservoirs or bottles, feed and permeate pumps, pressure and flow sensors and valves
- **Tubing and connections:** Auxiliary tubing sets, fittings and aseptic connectors

Software and Automation

Integrated user interface software is designed to provide intuitive and easy-to-use operational control of the system. Logged performance or audit data can be accessed locally via the on-device touchscreen HMI or remotely via automation production control.

- Consistent UI software across all Avantor systems and platforms
- Regulatory compliance: 21 CFR Part 11, GAMP 5, ISA88
- Open communication connectivity with other unit operations, upstream and downstream, independent of manufacturer
- Customized HMI software compatible with Siemens and Exor screens
- Multiple communication protocols (supervisory control and data acquisition, SCADA) supported, allowing seamless integration to common automation production control systems



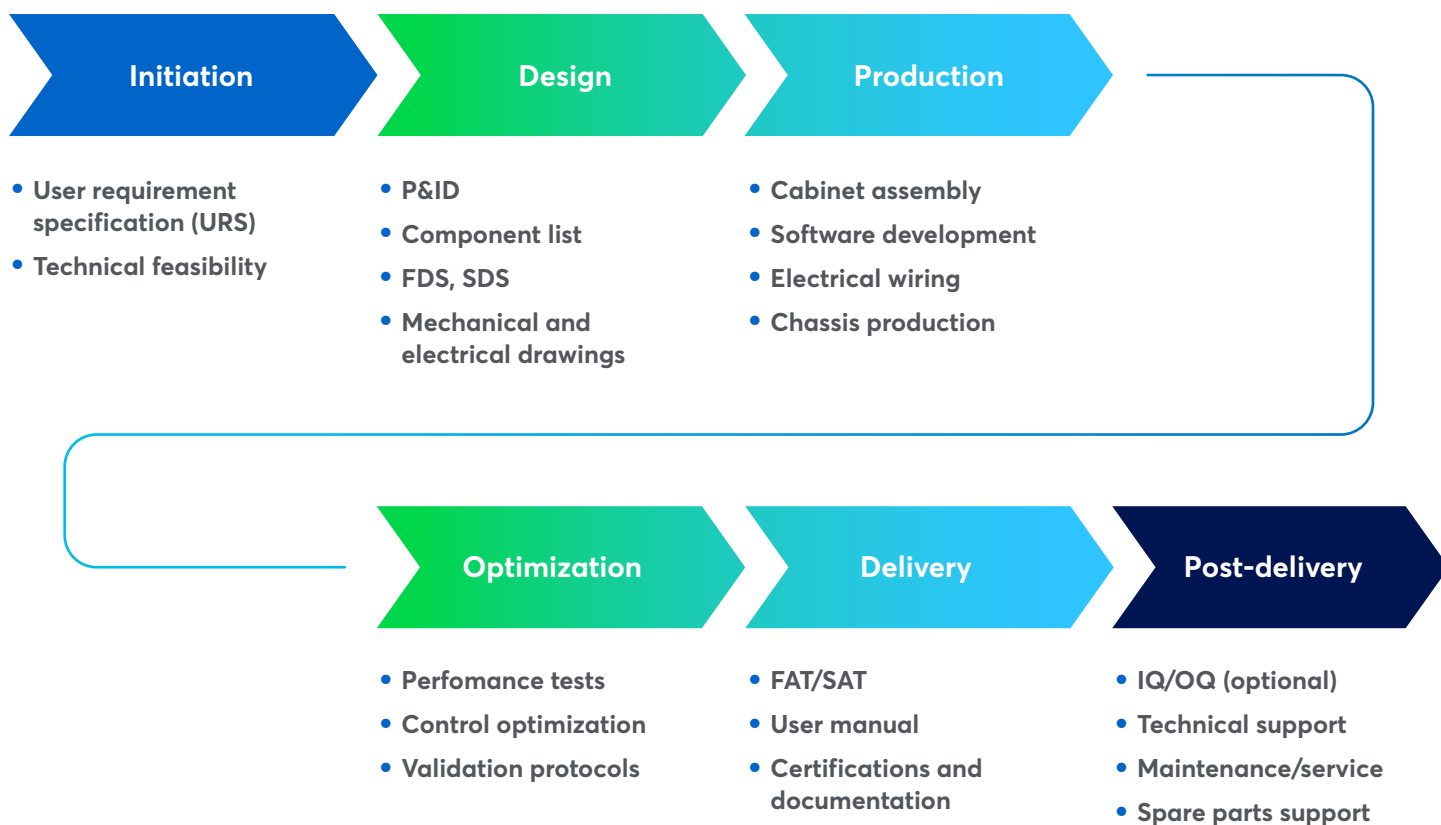
Engineered-to-Order Expertise and Process

HIGHLIGHTS

- Completed **over 300** projects and delivered **over 900** systems globally
- ISO 9001-certified manufacturing facility in the Netherlands
- Dedicated project manager for ETO projects



Masterflex ETO project workflow





For more information, visit
corporate.avantorsciences.com

or contact a
[Masterflex](#) expert.



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