



Purpose-built single-use fermentors

Designed for the unique requirements
of microbial fermentation

Designed to meet your needs

The Thermo Scientific™ HyPerforma™ Single-Use Fermentor (S.U.F.) was designed to meet your unique and rigorous needs for microbial applications, while maintaining the flexibility, ease of use, and efficiency found with our single-use systems.



Robust and scalable

The HyPerforma S.U.F. and Thermo Scientific™ BioProcess Container (BPC) system use traditional stainless steel fermentor engineering principles to meet the high demands of industrial microbiology with efficient mass transfer, mixing, and temperature control.

The complete line of HyPerforma S.U.F. systems offer:

- 30 L and 300 L working volume with a 5:1 turndown ratio
- Vertically centered, top-driven impeller locations for powerful mixing
- Consistent scalability from process development through production

Powerful and efficient

The HyPerforma S.U.F. and BPC system is designed to deliver optimal growth of microorganisms through high gas flow rates, powerful agitation, and efficient cooling. Purpose-built to match the process demands of traditional clean-in-place and steam in-place (CIP/SIP) stainless steel fermentors, the S.U.F. design makes the transition from traditional to single-use fermentors straightforward and easy.

The system offers:

- Powerful mixing from a top-driven shaft with three Rushton impellers in a baffled vessel
- Controlled, flexible delivery of air and oxygen through drilled-hole spargers
- Reliable off-gassing with proprietary exhaust management system
- Increased cooling capacity with 3:1 aspect ratio that maximizes surface area
- Automated foam control to reduce the risk of excess foam buildup
- Robust BPC design with integrated sensor technology

The S.U.F. BioProcess Container: Quality and flexibility

Thermo Scientific BPCs are available for the S.U.F. in standard or customized configurations, with your choice of Thermo Scientific™ CX5-14 Film or Thermo Scientific™ Aegis™ 5-14 Film. The BPC includes a three-Rushton impeller assembly, sparger, vent filter, and integrally sealed ports for sensor probes and line set additions. The innovative exhaust management system effectively condenses exhaust gases and transfers condensate back into the fermentor, preventing potential vent filter blockage and bag pressurization.

Custom BPCs accommodate a range of applications. A variety of components have been qualified to maximize design flexibility, including:

- Single-use sensors
- Tubing and clamps
- Connector types

Tank design: Ergonomic and elegant

The S.U.F. tank has an ergonomic design, compact footprint, and is highly configurable through an open-architecture approach. The single-use format eliminates time-consuming CIP/SIP procedures.

Features include:

- Simplified BPC loading with a vertical access door
- Clear access to harvest lines with the open-frame design
- Water jacket for effective heat transfer
- Easy setup of the BPC with the drive shaft



Controllers and options: Adaptability and choice

The HyPerforma S.U.F. offers a choice of control systems in either an open-architecture or turnkey system. An open-architecture system allows you to integrate with any controller, perhaps one already in use in your facility. Alternatively, the S.U.F. can be supplied as a ready-to-use, turnkey system with a Finesse™ or Applikon™ controller.

Additional options include:

- Load cells
- Exhaust gas vent filter heater
- Cable management tree
- Electrical box for remote agitation control

Note: Water jacket systems require an external temperature control unit.





Technical support: Knowledgeable and comprehensive

Our global field-based technical support team is here to help you every step of the way with local installation and technical support. We can also provide you with additional support documentation upon request.

All systems are supplied with:

- Comprehensive user's guide
- Equipment turnover package
- Validation guide

System specifications

Specification	30 L	300 L
Rated liquid working volume	30 L	300 L
Total reactor volume (liquid and gas)	43 L	435 L
Fluid geometry at working volume (height/diameter) ratio	26.6 cm (10.50")	57.2 cm (22.5")
Overall reactor geometry (height/diameter) ratio	3:1	3:1
Impeller (quantity x blade count)	3 x 6	3 x 6
Mixing rate range	55–600 rpm	35–375 rpm
Tank dimensions	91.6 x 54.3 x 218.44 cm (36.08 x 21.37 x 86")	130.7 x 89.2 x 280.97 cm (51.44 x 35.11 x 110.62")
Jacketed tank weight, dry/wet (at full working volume)	Dry skid weight (mass) 524 lb (238 kg) Wet skid weight: (mass) 531 lb (241 kg)	Dry skid weight: (mass) 1,223 lb (555 kg) Wet skid weight: (mass) 1,257 lb (570 kg)
Max gas flow rates	60 slpm	600 slpm
Heating times	Approximate liquid heat-up time (2–37°C), full volume 1.16 hr, half volume 1 hr	Approximate liquid heat-up time (2–37°C), full volume 1.8 hr, half volume 1.3 hr

System overview

S.U.F. hardware unit

Available in turnkey format	Complete mixing system with a water jacket for temperature control
	Drive shaft inserts into the BPC through the mixing drive motor and locks into the BPC agitator assembly

S.U.F. BPC

Supplied sterile and ready to use	Agitator assembly is a single-use (polyethylene) impeller with a bearing/seal assembly linked to an external mixer drive
	Gas control with drilled-hole spargers
	Exhaust management system with options for multiple vent filters based on gas flow needs
	Integrally sealed ports in the S.U.F. BPC allows for sensor probes and line sets addition
	Available in Thermo Scientific CX5-14 and Aegis5-14 film options

System options

Adaptable to your needs	Exhaust condenser unit
	Exhaust gas vent filter heater
	Integrated foam sensor
	Load cells (3)
	Cable management tree
	Process control system
	Optional electrical box for remote agitation control - S.U.F.s require a separate external temperature control unit
	Choose an open-architecture approach or a turnkey, ready-to-use S.U.F. system



Ordering information

Size	Description	Cat. No.
30 L	Jacketed, AC motor, with 2-position vent filter bracket	SUF0030.9001
30 L	Jacketed, AC motor, with 2-position vent filter bracket and 120 VAC electrical box	SUF0030.9002
30 L	Jacketed, AC motor, with 2-position vent filter bracket and 240 VAC electrical box	SUF0030.9003
300 L	Jacketed, AC motor, with 2-position center filter bracket	SUF0300.9001
300 L	Jacketed, AC motor, with 240 VAC electrical box and 2-position vent filter bracket	SUF0300.9002

See the other products and services we offer for your bioproduction needs



Single-use technologies

Our single-use technologies are standard and customizable systems, from upstream to downstream bioprocessing. Thermo Scientific™ single-use bioreactors, fermentors, mixers, and bioprocess containers are relied upon across the workflow for rapid changeover and ease of use.



Cell culture products

Our Gibco™ portfolio offers a full array of innovative performance products and knowledge-based services, including fast and flexible cell line development, media and feeds, class-setting technologies, quality custom media development, and media optimizing services.



Protein purification and chromatography

We offer a full range of purification technologies, from affinity to ion exchange to reversed-phase chromatography. When capacity, resolution, and yield are critical, choose Thermo Scientific™ POROS™ resins for excellent downstream mAb and recombinant protein chromatography results. Thermo Scientific™ CaptureSelect™ affinity ligands provide purification that's stable, specific, and designed for virtually any target.



Analytical solutions

Trust our SEQ analytical solutions for contaminant identification and detection. Our analytical solutions use rapid molecular methods for pharmaceutical manufacturing to help ensure the quality and safety of your pharmaceutical products, especially when accuracy and time-to-results are critical.

Our comprehensive group of bioprocessing portfolios provides you with innovative solutions and exceptional customer service for every stage of bioproduction. Our products and services are backed by decades of expertise and dedication, providing you with the quality and innovation you need and deserve. Let's move forward together.



Integrated solutions for bioproduction

Single-Use Mixers (S.U.M.s)

A variety of options up to 5,000 L for both upstream and downstream applications



Liquid- and dry-format media

We offer both custom manufacturing and a full range of chemically defined performance media and supplement products



BioProcess Containers (BPCs)

A variety of configurations up to 2,000 L for liquid harvest, storage, and transportation



Sera

Our sera are the industry standards for consistent quality and reliability



Single-Use Bioreactors (S.U.B.s)

50–2,000 L bioreactors capable of integrating with an existing control system



Buffers and process liquids

Custom and standard buffers and process liquids, including Gibco™ Water for Injection (WFI) quality water



Heat transfer

A modular heat exchanger which utilizes BPCs as the sterile fluid path.



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