



Purpose-built single-use fermentors

Standard and enhanced solutions designed for the unique requirements of aerobic microbial fermentation

Designed to meet your needs

The design of the Thermo Scientific™ HyPerforma™ Single-Use Fermentor (S.U.F.) was generated with spatial and practical challenges of the fermentation process in mind, and offers specifications focused on maintaining a closed, sterile system while providing ease-of-use specification improvements.

The Thermo Scientific™ HyPerforma™ enhanced Single-Use Fermentor (eS.U.F.) further enables the production of high demanding dense cultures with optimized parabolic turbine impellers and 35% more cooling jacketed surface area.

The HyPerforma S.U.F. systems from Thermo Fisher Scientific help enable companies to bring vaccines, therapeutics, and other medicines to the market with robust performance and streamlined scale-up.



Robust and scalable

The HyPerforma S.U.F. and Thermo Scientific™ BioProcess Container (BPC) system uses traditional stainless steel fermentor engineering principles to meet the high demands of industrial microbiology with efficient mass transfer, mixing, and temperature control. Thermo Fisher Scientific offers stand-alone and collective workflow solutions, incorporating flexible or rigid containment with S.U.F. technologies to support microbial fermentation. Consistency in specification and performance across size builds confidence in quality and creates efficacy during the scale-up process.

The 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
- Single-use sensors: pH, DO, temperature, foam, pressure, and biomass
- High-flow exhaust filters
- Four 1/8 in. (ID) feed, two 3/8 in. (ID) fill, 1/2 in. drain, and sparge filter line set(s)

The HyPerforma eS.U.F. features:

- 35% increase in jacketed surface area for the 300 L size
- 4x higher oxygen delivery in 30 L and 300 L due to a larger, more powerful impeller design
- Oxygen delivery as good as or better than stainless steel fermentors
- Redesigned BPC with three enhanced parabolic turbine impellers

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 HyPerforma S.U.F. was created as a closed system that facilitates the growth of microorganisms, equipped with a sterile holding tank, impeller, coolant system, control panel, sparging capability, and input and output channel. This design enables researchers to monitor specific maintenance parameters including temperature, oxygenation level, agitation, speed, and the need for additional nutrient supplements or anti-foam additives with limited risk of impact to the bulk media broth.

The HyPerforma S.U.F. and BPC 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 a proprietary exhaust management system
- Increased cooling capacity with a 3:1 aspect ratio that maximizes surface area
- Automated foam control to reduce the risk of excess foam buildup
- Robust BPC design with integrated single-use sensor technology for continuous assessment of pH, DO, temperature, foam, and pressure

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 Thermo Scientific™ Aegis™ 5-14 film. The BPC includes a three-Rushton or enhanced 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.

In order to meet increased cooling requirements of rapid exponentially growing high-oxygen-consuming cultures, enhancements including larger turbine impellers, increased cooling capacity during BPC loading, and power consumption savings were incorporated into the design.

Tank design: ergonomic and elegant

The S.U.F. tank has an ergonomic design, compact footprint, and is available with either the Thermo Scientific™ HyPerforma™ G3Lite Controller created as a turnkey option for ease of operation, or as an open- architecture approach compatible with any controller depending on the level of customization needed. The single-use format eliminates time-consuming CIP/SIP procedures, delivering critical efficiency savings to the fermentation process.

The HyPerforma S.U.F. was designed with a singular temperature well and sampling port that sits below the probe belt for ease of access. Probes for measuring pH and dissolved oxygen function within the closed system are sterile and can be autoclaved with the added feature of hanging clips for angle and height adjustment to accommodate each end use.

Features include:

- Simple BPC loading with a vertical access door
- Water jacket* for effective heat transfer
- Easy setup of the BPC with the drive shaft

* Water jacket systems require an external temperature control unit purchased separately.



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. Alternatively, the S.U.F. can be supplied as a ready-to-use, turnkey system with a Thermo Scientific™ HyPerforma™ G3Lite or G3Pro Controller.

Additional options include:

- Load cells
- Exhaust gas vent filter heater
- Cable and tubing management tree
- Electrical box for open- architecture, stand-alone, or remote agitation control





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 can be supplied with a:

- Comprehensive user guide
- Equipment turnover package
- Validation guide

Ordering information

Product	Size	Cat. No.
HyPerforma enhanced Single-Use Fermentor, jacketed, AC motor, with 4-position vent filter bracket, pinch clamp, 151 W vent heaters	300 L	SUF0300.9100
HyPerforma enhanced Single-Use Fermentor BioProcess Container, Aegis5-14 film, pH/DO sensor, foam sensor, one 5 in. exhaust filter	30 L	SUT00007
HyPerforma enhanced Single-Use Fermentor BioProcess Container, Aegis5-14 film, pH/DO sensor, foam sensor, two 10 in. exhaust filters	300 L	SUT00008
HyPerforma Single-Use Fermentor System, jacketed, AC motor, with 2-position vent filter bracket	30 L	SUF0030.9001
HyPerforma Single-Use Fermentor System, jacketed, AC motor, with 2-position vent filter bracket and 120 VAC electrical box	30 L	SUF0030.9002
HyPerforma Single-Use Fermentor System, jacketed, AC motor, with 2-position vent filter bracket and 240 VAC electrical box	30 L	SUF0030.9003
HyPerforma Single-Use Fermentor System, jacketed, AC motor, with 2-position center filter bracket	300 L	SUF0300.9001
HyPerforma Single-Use Fermentor System, jacketed, AC motor, 2-position vent filter bracket and 240 VAC electrical box	300 L	SUF0300.9002

Find out more at thermofisher.com/suf