



Single-Use Simplicity

BioBLU® c and BioBLU p Single-Use Bioreactors for cell culture



»Proven stirred-tank design meets single-use technology.«

Combine the benefits of single-use technology with the reliable performance of conventional glass or stainless steel bioreactors – BioBLU Single-Use Bioreactors are rigid-walled stirred-tank bioreactors which can serve as a viable replacement for traditional reusable vessels. The BioBLU c portfolio has been optimized for the cultivation of mammalian cells.

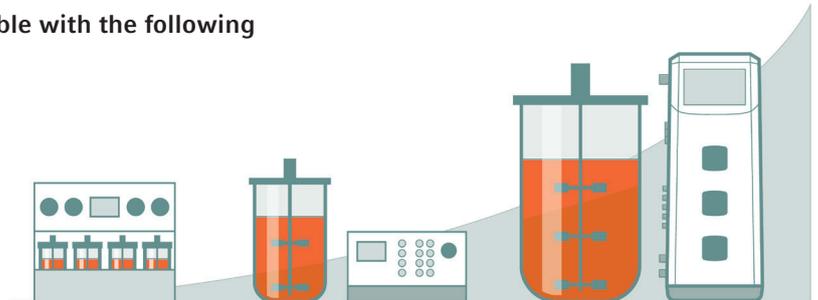
How BioBLU® c Single-Use Bioreactors benefit you:

- > Scalability: Working volume range 100 mL to 40 L
- > Risk mitigation: Reduced contamination and cross-contamination risk
- > Productivity: Reduced turn-around times; less cleaning effort
- > Flexibility: Several bioreactor versions meet different process needs

Broad compatibility

BioBLU® c Single-Use Bioreactors are compatible with the following bioreactor control systems from Eppendorf:

- > DASbox® Mini Bioreactor System
- > DASGIP® Parallel Bioreactor Systems
- > SciVario® twin
- > BioFlo® 120
- > BioFlo 320
- > BioFlo/CelliGen 115
- > BioFlo/CelliGen 310



Simple conversion to single-use



Reduce capital investment by using your existing equipment

- > BioBLU Single-Use Bioreactor Adaptor Kits and Single-Use Bioreactor Bundles enable your existing Eppendorf small or bench-scale bioreactor system for single-use operation without the expense of replacing the whole system.
- > The kits facilitate the conversion of your bioreactor system from single-use to reusable bioreactors and vice versa.
- > BioBLU Single-Use Bioreactors can be connected to selected third-party bioprocess control systems as well. Please contact your Eppendorf sales representative for more information.



Application Driven

Designed for the cultivation of mammalian cells



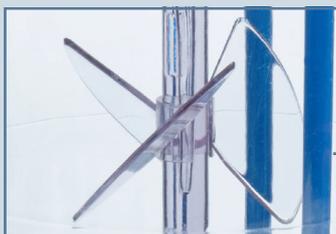
Weldable and easy-to-connect tubing

In-field flexibility and ease-of-use



Flexible gassing

Overlay and submerged gassing; options for open pipe-, micro- or macro-sparger to best suit your application



Industry standard design

Standard impeller size and bioreactor dimensions for efficient mixing and mass transfer, and scalable results



Effective exhaust treatment

Liquid-free exhaust condensation (Peltier) or electric heater band

Industrial head plate

Integration of standard sensors, liquid addition and sampling ports. Enclosed magnetic drive reduces contamination risk



Head plate adaptors

Single-use septa, tri-ports, and compression fitting adaptors facilitate the flexible use of Pg 13.5 ports



Non-invasive sensors

Non-invasive standard DO and optical pH sensor ports remove sensor failure concerns



Scalability

Scale-up your bioprocess up to 400-fold

BioBLU c Single-Use Bioreactors are available in different sizes and facilitate bioprocessing in working volumes from 100 mL to 40 L. The differently sized bioreactors have similar geometries. Scale-up relevant parameters, like tip speed range, power numbers and $k_L a$ range have been characterized to support scale-up strategy development. Bioprocess scale-up is further simplified by the *Scale Up Assist* software feature for some bioreactor control systems from Eppendorf.



The differently sized bioreactors have similar geometries

	BioBLU® 0.3c	BioBLU® 1c	BioBLU® 3c	BioBLU® 10c	BioBLU® 50c
Working volume	100 – 250 mL	320 mL – 1.25 L	1.25 – 3.75 L	3.3 – 10 L	18 – 40 L
Ratio H_i/D_i = Bioreactor height : Bioreactor ID	1.8	2.0	2.0	2.0	2.0
Ratio $h_{v_{wmax}}/D_i$ = Max. liquid height : Bioreactor ID	1.2	1.5	1.5	1.5	1.3
Number of impellers	1	1 or 2	1 or 2	1	1
Ratio d/D_i = Impeller OD : Bioreactor ID	0.5	0.5	0.5	0.5	0.5

ID = inner diameter, OD = outer diameter



Cell Culture Scale-Up Using Stirred-Tank Single-Use Bioreactors

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Bioprocessing | Bioprocess | Cell Culture | Scalability | News

Read, how bioreactor characterization helped scaling-up a cell culture bioprocess in single-use bioreactors

Cell Culture Scale-Up Using Stirred-Tank Single-Use Bioreactors

In this article we discuss, how we characterized the BioBLU c Single-Use Bioreactor portfolio to streamline cell culture scale-up and demonstrate, how we scaled-up the working volume of a cell culture process for mAB production. Find out more!

www.eppendorf.group/cell-culture-scale-up





Risk Mitigation

Reduce the the risk of process failure

BioBLU Single-Use Bioreactors reduce the risk of failure during setup and during the runtime of the process. Like this they help you protecting your precious cells and products and reduce the risk for time-consuming and costly batch failures.

Reduced risk for process failure

- > Non-invasive sensor options for temperature, dissolved oxygen, and pH reduce the contamination risk and offer the possibility for sensor replacement during the run
- > Sealed magnetic bearings further reduce the contamination risk
- > Single-use nature eliminates the cross-contamination risk
- > Bioreactors are individually pressure-tested to ensure bioreactor integrity.
- > Simplify installation with rigid-wall design, no risk for damages due to folding of bioreactor bags



Polymer expertise by Eppendorf

Decades of experience in the field of sophisticated polymer products was key to the development of BioBLU Single-Use Bioreactors.

- > Bioreactor body and head plate comprised of single layer injection molded plastic not containing softeners
- > The use of virgin raw materials eliminates risks from the use of recycled materials
- > Eppendorf sources all raw material directly

Leachables and Extractables

May originate from compounds used in polymer manufacturing such as softeners, stabilizers, and antioxidants. Especially cytotoxic effects and altered product characteristics cause safety concerns in biopharmaceutical manufacturing.

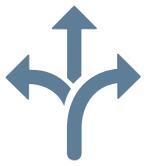
Extractables

- > Substances that can be extracted from the material under defined, harsh extraction conditions (e.g. extreme temperatures, presence of solvent)

Leachables

- > Substances that can be released from the material under process conditions
- > Usually a subset of the extractables, whose composition and concentration depend, among other things, on the process duration, the medium composition, the pH value, and the temperature
- > Therefore, leachable data must be determined for each individual process condition

$\begin{array}{c} \text{Cl} \\ \\ \text{H}-\text{C}-\text{Cl} \\ \\ \text{H} \end{array}$	$\left[\begin{array}{c} \text{H} \\ \\ \text{C}=\text{C} \\ \\ \text{H} \end{array} \right]_{n>15}$	$\begin{array}{c} \text{O} \\ \\ \text{C} \\ / \quad \backslash \\ \text{O}-\text{R}^1 \quad \text{O}-\text{R}^2 \end{array}$
Volatiles (organic compounds)	Semi-volatiles (organic compounds)	Non-volatiles (organic compounds)
	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> Cadmium 48 Cd 112.41 </div>	$\begin{array}{c} \text{O} \\ \\ \text{H}-\text{C}-\text{O}-\text{H} \end{array}$ <hr/> $\left[\text{H}-\text{N}^{\ominus}-\text{H} \right]^{-}$
Conducting ions	Inorganic elements	Acidic or basic compounds



Flexibility

Meet the needs of different cell types

Different cell types have different needs. Several BioBLU Single-Use Bioreactor versions were designed to meet the special needs of suspension cells, anchorage-dependent cells, and stem cells.



BioBLU® c Single-Use Bioreactors

For the scalable cultivation of cells in suspension, on microcarriers or as cell aggregates.

- > Working volume range:
 - BioBLU 0.3c: 100 mL – 250 mL
 - BioBLU 1c: 320 mL – 1.25 L
 - BioBLU 3c: 1.25 L – 3.75 L
 - BioBLU 10c: 3.3 L – 10 L
 - BioBLU 50c: 18 L – 40 L
- > Successfully used for the cultivation of different cell types, including CHO, HEK293, Sf9, CD4⁺ T cells, mesenchymal stem cell, and induced pluripotent stem cells



BioBLU® 5p Single-Use Bioreactor

For the cultivation of adherent cells and for perfusion processes.

- > The bioreactor is pre-loaded with Fibra-Cel® Disks, a solid growth support matrix
- > It utilizes the proprietary Eppendorf packed-bed impeller design, providing a low-shear environment
- > Eliminates the need for cell filtration to separate cells from secreted end products
- > Working volume: 3.75 L



BioBLU® 0.3sc Single-Use Bioreactor

Optimized to suit the special needs of stem cells.

- > An 8-blade impeller ensures reduced cell settling and very good mixing already at low agitation speeds to reduce the stress for your stem cells
- > Optimized to support cell aggregate formation
- > Working volume: 100 mL – 250 mL

Learn more about cell culture in bioreactors!



www.eppendorf.group/bioprocess-cells

Get to know more about Fibra-Cel Disks!



www.eppendorf.group/fibra-cel-disks

Learn more about our bioprocessing solutions for cell and gene therapy development!



www.eppendorf.group/bioprocess-cgt

Technical data¹

	BioBLU® 0.3c BioBLU® 0.3sc	BioBLU® 1c	BioBLU® 3c	BioBLU® 10c	BioBLU® 50c	BioBLU® 5p
Working volume (total)	100 – 250 mL (380 mL)	320 mL – 1.25 L (1.8 L)	1.25 – 3.75 L (5 L)	3.3 – 10 L (13.3 L)	18 – 40 L (50 L)	3.75 L (5 L)
Material	Bioreactor: PS, PC, tubing: silicone, C-Flex;					
Sterilization	Irradiated by > 15 kGy (β) or > 25 kGy (X-ray). SAL-level 10 ⁻⁶ for X-ray irradiated BioBLU® Single-Use Bioreactors					Irradiated by > 15 kGy (β)
Head plate ports						
Pg 13.5	2x	3x	4x	4x	1x	1x
Liquid addition	1x submerged, 1x overlay	2x submerged, 2x overlay	1x submerged, 3x overlay	1x submerged, 3x overlay	3x overlay	3x overlay
DO sensor port	1x (permeable gas membrane)	1x (permeable gas membrane)	1x (permeable gas membrane) ²	1x (permeable gas membrane) ²	1x (permeable gas membrane)	1x (permeable gas membrane)
Optical pH sensor port	■ ²	■ ²	■ ²	■ ²	■	■
Gas sparge	■	■	■	■	■	■
Gas overlay	■	■	■	■	■	■
Exhaust	■	■	■	■	■	■
Harvest tube	■	■	■	■	■	■
Thermowell	■	■	■	■	■	■
Drive	Magnetic overhead drive					
Fibra-Cel® disks	–	–	–	–	–	150 g
Recommended agitation speed	20 – 500 rpm (BioBLU 0.3c) 20 – 200 rpm (BioBLU 0.3sc)	30 – 600 rpm	25 – 200 rpm	25 – 200 rpm	25 – 150 rpm	25 – 200 rpm
Exhaust treatment³	Liquid-free (Peltier)	Liquid-free (Peltier) or water-cooled	Electric heater band or Peltier	Electric heater band	Electric heater band	Electric heater band or Peltier

Ordering information

Description	Working volume	Sparger	Impeller	pH	Quantity	Order no.	Order no.
						(X-ray irradiated)	(β-irradiated)
BioBLU® 0.3c	100 – 250 mL	Open pipe	1x pitched blade	Standard	4-pack	1386101000	1386100000
BioBLU® 0.3c	100 – 250 mL	Open pipe	1x pitched blade	Optical	4-pack	1386101500	1386100200
BioBLU® 0.3sc	100 – 250 mL	Open pipe	1x 8-blade	Optical	4-pack	1386102000	1386100600
BioBLU® 1c	320 mL – 1.25 L	Open pipe	1x pitched blade	Standard	4-pack	1386111000	1386110000
BioBLU® 1c	320 mL – 1.25 L	Open pipe	1x pitched blade	Optical	4-pack	1386112000	1386110400
BioBLU® 1c	320 mL – 1.25 L	Open pipe	2x pitched blade	Standard	4-pack	1386111100	1386110100
BioBLU® 1c	320 mL – 1.25 L	Open pipe	2x pitched blade	Optical	4-pack	1386112100	1386110500
BioBLU® 3c	1.25 L – 3.75 L	Microsparger	1x pitched blade	Optical	1-pack	1386124000	1386000100
BioBLU® 3c	1.25 L – 3.75 L	Macrosparger	1x pitched blade	Optical	1-pack	1386125000	1386000300
BioBLU® 3c	1.25 L – 3.75 L	Microsparger	2x pitched blade	Optical	1-pack	1386126000	1386120000
BioBLU® 3c	1.25 L – 3.75 L	Macrosparger	2x pitched blade	Optical	1-pack	1386127000	1386121000
BioBLU® 5p	3.75 L	Microsparger	Packed bed	Optical	1-pack	–	M1363-0119
BioBLU® 5p	3.75 L	Macrosparger	Packed bed	Optical	1-pack	–	M1363-0133
BioBLU® 10c	3.3 L – 10 L	Microsparger	1x pitched blade	Optical	1-pack	1386140300	1386140000
BioBLU® 10c	3.3 L – 10 L	Macrosparger	1x pitched blade	Optical	1-pack	1386141300	1386141000
BioBLU® 50c	18 L – 40 L	Microsparger	1x pitched blade	Optical	1-pack	1386162000	M1363-0131
BioBLU® 50c	18 L – 40 L	Macrosparger	1x pitched blade	Optical	1-pack	1386163000	M1363-0129

¹ Technical specifications are subject to change without notice. ² Utilizes 1x Pg 13.5 port. ³ These accessory parts are separate order items.

Your local distributor: www.eppendorf.com/contact

Eppendorf SE · Barkhausenweg 1 · 22339 Hamburg · Germany
eppendorf@eppendorf.com · www.eppendorf.com

www.eppendorf.com/bioprocess