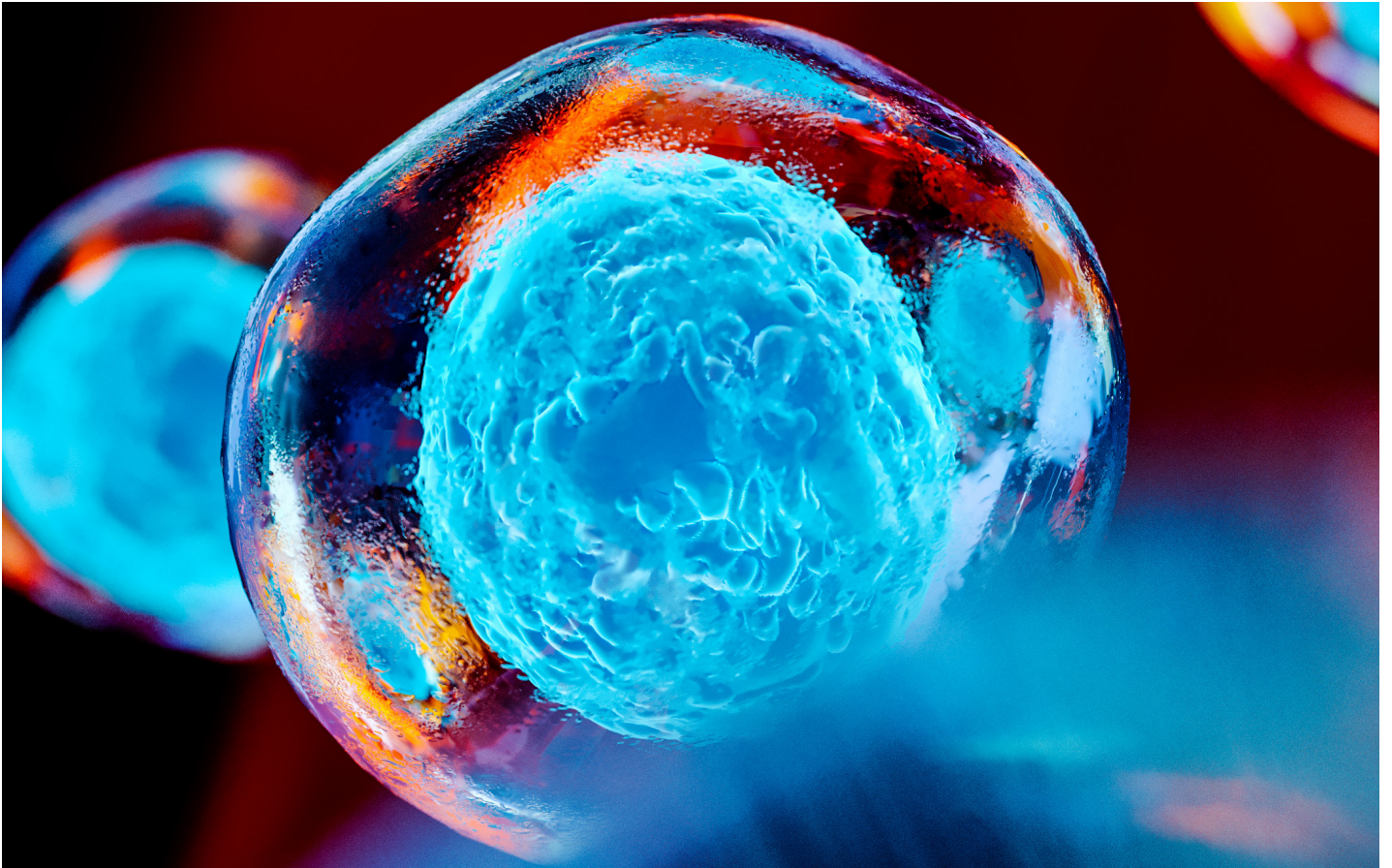




We Feel Relaxed

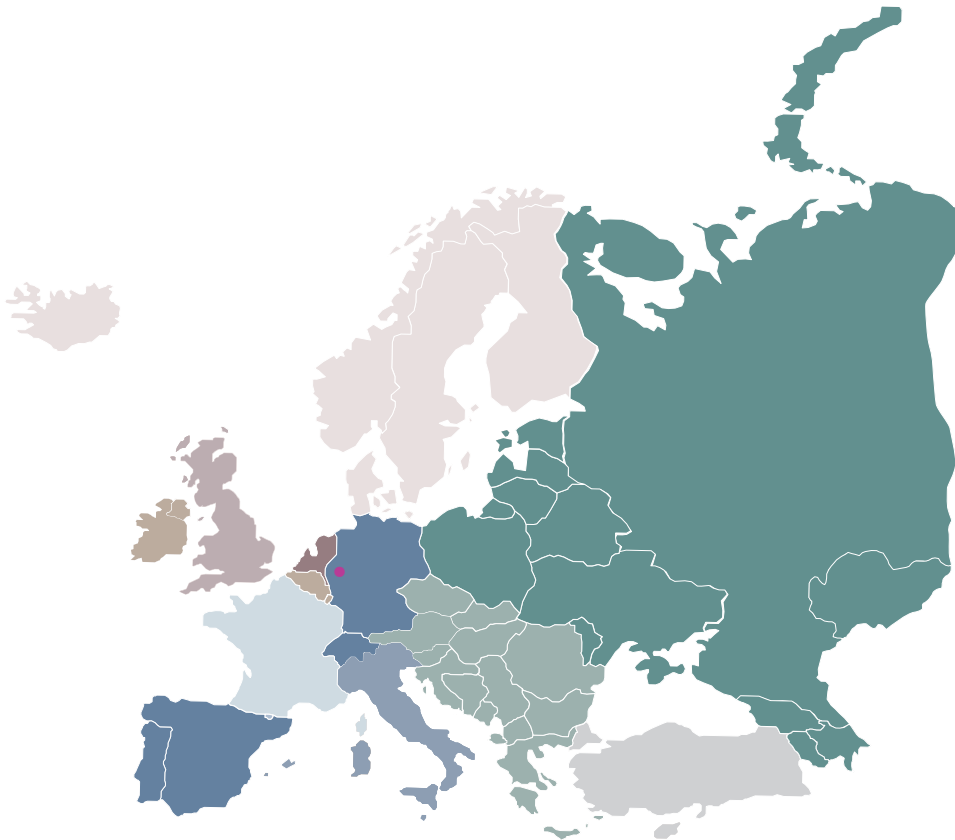
Reducing the stress for your stem cells with a stirred-tank bioreactor

»Cultivating Stem Cells in a Stirred-Tank Bioreactor?«



»They Will Suffer From Shear Stress.«

»Talk to our experts and learn how to reduce the stress for your stem cells and yourself.«



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»Solutions that grow with you.«

From the parallel mini bioreactor system for early stage bioprocess development, the benchtop and parallel bioreactor systems for the laboratory scale to the sterilize-in-place solutions for production: Eppendorf offers users from industry and research extensive bioprocess solutions from a single source and meets the highest quality demands.

Mini bioreactor systems



60 - 250 mL

Parallel benchtop systems



0.2 L - 1.8 L



0.7 - 3.8 L

Small scale

Bench scale

Benchtop bioreactors and fermentors



0.4 - 40 L



0.3 - 40 L

SIP bioreactors and fermentors



10.75 - 1,200 L

Pilot scale

Production scale

»I cannot reduce the stirring speed to minimize the stress for my cells, but they still settle.«

»Test and optimize different process parameters.«



DASbox® Parallel mini bioreactor system
60 - 250 mL working volume

- > 4-fold parallel system extendable to up to 24 parallel operated glass or single-use bioreactors
- > Compact mini bioreactor system: requires only 7 cm (3 inches) bench space per bioreactor
- > Optimal tool for DoE and scale down approaches
- > Agitation control supporting overhead-driven Rushton, marine-type or pitched blade impellers
- > Innovative liquid-free temperature control system needs no coolant agent supply and supports independent temperature control for each bioreactor
- > Accurate monitoring and control of pH, DO and level
- > Variable speed pumps for accurate liquid addition and operation in batch, fed-batch, continuous and cyclic perfusion mode
- > 4 mass flow controllers per bioreactor allow for individual mixing of air, N₂, O₂ and CO₂ to headspace and/or submerged
- > Novel liquid-free Peltier exhaust condenser with easy to handle slide in - slide out activation and deactivation
- > DASware control Software for advanced process control
- > Compatible with DASware Software Suite for interconnectivity and bioprocess information management

»Discover our newest vessel, optimized for slow stirring and aggregate formation«

- > Designed in collaboration with our customers
- > Especially developed for stem cell process development
- > 8-blade impeller ensures gentle mixing of your cell culture
- > Reduced cell settling and very good mixing already at low rpm reduce the stress for your stem cells
- > Improved DO-cap with chamfer corners and reduced overall diameter to reduce cell sedimentation on the cap
- > C-flex tubing allowing for welding connection
- > optical pH option for non-invasive pH-measurements



**BioBLU® 0.3sc Single-Use Vessel
(8-blade impeller)**

»My experiments just won't work, and I don't know why?«

»My processes are running fine, but I am afraid that scaling-up is too challenging.«

»Benefit from our renowned polymer expertise and switch to BioBLU® Single-Use Vessels.«



BioBLU® Single-Use family
0.1 - 40 L working volume

- > Single-use solutions for small, bench and pilot-scale cell culture applications
- > The rigid-walled, stirred-tank design eliminates the potential for tears, pits, and folds during installation and provides many advantages over single-use bag design
- > The single-layer polymer design mitigates issues related to leachables and extractables
- > Technical and material documentation available to support your process validation activities
- > Reduced validation costs for cleaning and sterilization
- > Optional: Built-in optical pH sensor technology for BioBLU 0.3c – 50c

»Step-by-step increase your working volume with our BioFlo® 320 Control Station.«



**BioFlo 320
Bench-scale
Bioreactor Control
System**

0.6 - 10.5 L
working volume
(autoclavable)
0.25 - 40 L working
volume (single-use)

- > Extensive working range of 250 mL - 40 L on a single control platform.
- > Interchangeable autoclavable and BioBLU Single-Use Vessels.
- > Integrated Mettler Toledo® Intelligent Sensor Management (ISM®) platform.
- > Control up to eight systems from a single-user interface.
- > Field-upgradable TMFC drawers for sparge and overlay gas.
- > Enhanced software package with new cascade and time profile features.
- > Built-in optical pH sensing technology for use with the BioBLU Single-Use Vessels.
- > Ethernet communication for multi-unit control, Eppendorf SCADA software, and IP addressing.
- > Up to six integrated pumps capable of operating in variable speed mode.
- > Eight independently controlled process gas supplies.
- > Validation packages available for GMP regulated processes.

»I am afraid of cross-contamination between individual runs.«

	DASbox® Mini Bioreactor System	Small Scale Parallel Bioreactor Systems	Bench Scale Parallel Bioreactor Systems	BioFlo® 120	BioFlo® 320	CelliGen® 510
						
Working volume range¹	100 ⁵ - 250 mL	0.2 - 1.8 L	0.7 - 3.8 L	0.25 - 40 L	0.25 - 40 L	10.75 - 32 L
Single-use vessels available	•	•	•	•	•	
Glass vessels, autoclavable	•	•	•	•	•	
Stainless-steel vessels, SIP						•
Interchangeable vessels	•	•	•	•	•	
Bacteria/yeasts/fungi	•	•	•	•	•	
Plant cells/algae	•	•	•	•	•	•
Mammalian/animal cells	•	•	•	•	•	•
Stem cells	•	•	•	•	•	•
Insect cells	•	•	•	•	•	•
Number of parallel units	Up to 24	Up to 16	Up to 16		Up to 8	
Controller²	DWC	DWC	DWC	BCS	BCS	RPC/PLC
Touchscreen controller				•	•	•
BioCommand®				•	•	•
DASware®	•	•	•	•	•	
Gas mixing options	4 gas (air, N ₂ , O ₂ , CO ₂)	4 gas (air, N ₂ , O ₂ , CO ₂)	4 gas (air, N ₂ , O ₂ , CO ₂)	4 gas (air, N ₂ , O ₂ , CO ₂)	4 gas (air, N ₂ , O ₂ , CO ₂)	4 gas (air, N ₂ , O ₂ , CO ₂)
Gas flow control³	TMFC	R or TMFC	R or TMFC	R or TMFC	TMFC	TMFC
Exhaust analysis	•	•	•	•	•	•
Optical density measurement	•	•	•	•	•	• ⁴
Validation					•	•

¹ Realized using multiple vessels² Controllers: DWC=DASware control, RPC=Reactor Process Controller, BCS=BioFlo Control Software, PLC=Programmable Logic Controller³ Gas Flow Controllers: R=Rotameter, TMFC=Thermal Mass Flow Controller⁴ OD measurement possible via third-party equipment⁵min working volume of 60 mL for single-se vessels with rushton impeller

Eppendorf Bioprocess Software — Much More Than Just Bioprocess Control

Eppendorf offers BioCommand®, DASware® control Supervisory Control and Data Acquisition (SCADA) software packages for advanced bioprocess control. The comprehensive DASware software suite provides next-generation bioprocess management.

DASware software suite

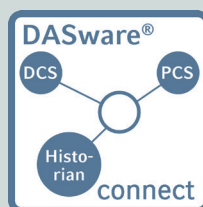
Next-generation bioprocess management

A suite of smart and flexible software solutions to accelerate bioprocess development, with DASware control for parallel bioprocess control. The DASware licences enable interconnectivity of bioreactors with external lab-devices, comprehensive data- and information management, Design of Experiments (DoE) and remote control of bioprocesses. DASware can be used with any Eppendorf benchtop bioreactor solution.



DASware control

- > Advanced process monitoring, control, and data logging - for parallel cultivation with individual control of each bioreactor



DASware connect

- > Integration into process control systems and legacy corporate historians facilitating company-wide access to all relevant bioprocess data



DASware access

- > Remote monitoring and control of bioprocesses via PC, Notebook and Netbook or with the DASGIP iApp via iPhone®, iPod touch® and iPad®



DASware design

- > Applies the Design of Experiments (DoE) concept via a full factorial DoE builder or by importing DoE designs from third-party DoE tools



DASware analyze

- > Seamless integration of external lab devices to the bioreactor allows for process automation and feedback control loops



DASware discover

- > A comprehensive and user-friendly information management solution for bioprocessing

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