

Introduction to CELL-tainer® technology

What is CELL-tainer® ?

It means a **new generation of single-use bioreactors with enhanced capabilities based on patented technology** is designed to meet **high-density process demands in single-use**.



How do CELL-tainer® bioreactors contribute to improving bioprocessing?

2D MOVEMENT



Bionet's product range features CELL-tainer® technology

CT1

CT2

CT3



CT1 0,05 L* 2,5 L 3 L

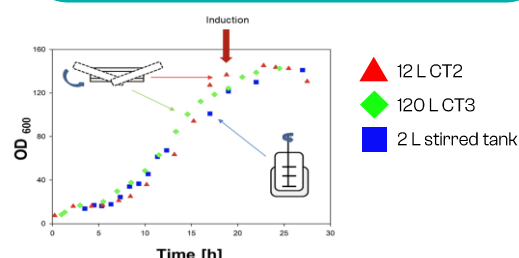
CT2 0,25 L* 12 L 25 L**

CT3 10 L 150 L 250 L

*To work on these volumes the expansion set is necessary.
**To use the CT2 3D bags the enlarged tray is necessary. The enlarged tray is linked to a reduced rotation angle and thus lower mass transfer.

● Working volume for the MB
● Working volume for the CC

Proven scalability across the CELL-tainer® line



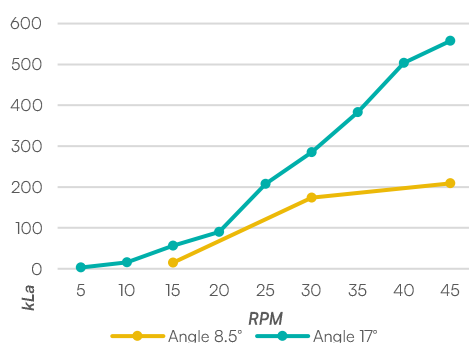
E. coli growth comparison in 2 L, 12 L, and 120 L bioreactors demonstrates consistent performance from lab to production scale

CFD models ensure scalable performance in mixing, power, and mass transfer across angles, speeds, volumes, and bag shapes.

Achieving better performance in single-use

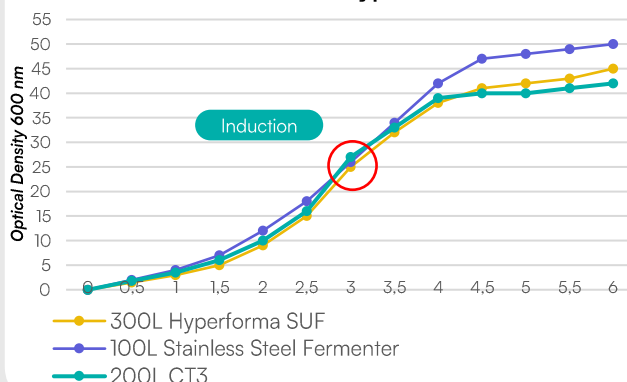
By offering a **patented 2D rocking movement** that no one else can provide, Bionet CELL-tainer® enables the increase of power input per volume and G/L mass transfer more than 500 h⁻¹ kLa, resulting in **higher density and protein production levels at low shear**.

Maximising oxygen transfer: how rocking angle in CT2 (8.5° vs 17°) affects kLa in 11-Litre



RPM	Average kLa (h ⁻¹) at 8.5°	Average kLa (h ⁻¹) at 17°
5		3
10		15,7
15	15	56,7
20		90,1
25		192,7
30	173,7	285,1
35		383,5
40		504,1
45	208,9	557,5

High cell density with low shear stress: CELL-tainer® vs. other types of fermenters



Proven performance across different processes

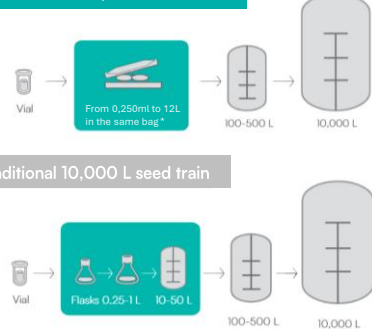
Organism	OD _{600nm}	Process time [h]
<i>E. coli</i>	180	39
<i>P. pastoris</i>	572	66-72
<i>B. subtilis</i> (for seeding)	4*10 ¹⁰ CFU/mL	42

Reducing operation risks and costs

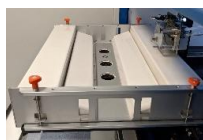
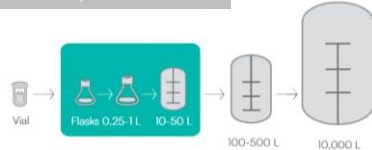
The patented expansion channel and bottom-mounted sensor allow for an **unparalleled working volume range**, with a **turn-down ratio up to 100**. This unique feature **reduces the number of process stages** and therefore the cost of single-use consumables, operator time and minimises contamination risk.

Fewer steps, less risk, more efficiency: CELL-tainer® vs traditional seed train

CELL-tainer® 10,000 L seed train



Traditional 10,000 L seed train

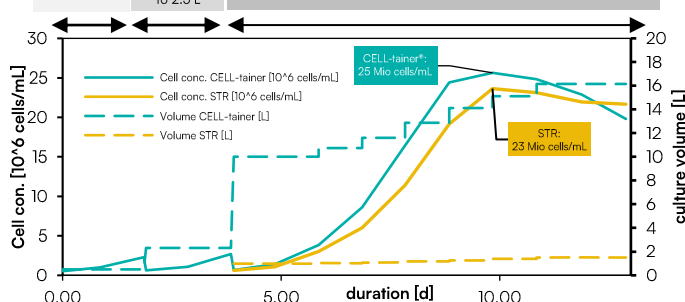


Seamless scale-up within the same bag with **CELL-tainer® expansion set**:

- CT1: 50—2,500 mL
- CT2: 250—12,000 mL
- CT3: 10—150 L

Higher cell density and scalable growth: CHO-K1 fed-batch CELL-tainer® vs. STR

CELL-tainer®: Inoculation at 0.5 L
CELL-tainer®: Volume increase to 2.3 L
CELL-tainer®: Volume increase to 10.0 L and start Fed Batch (final culture volume 16.0 L)
STR: inoculation at 1.0 L and start Fed-Batch (final culture volume 1.5 L)



	CELL-tainer®	STR
Max VCD	25 Mio cells/mL	23 Mio cells/mL
μ_{max}	0.73 d ⁻¹	0.70 d ⁻¹

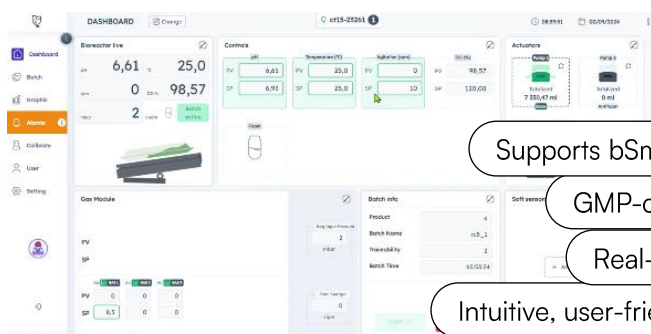
Adapting to the changing and evolving needs of your project

By offering adjustment of rocking angle and speed, highly customizable bags and a range of Plug&Play add-ons, the CELL-tainer® is **highly configurable and expandable**, which makes it possible to handle microbial, mammalian, plant and insect cells in the same device, making it ideal for **both cell culture and microbial applications**. **CELL-tainer® adapts to your evolving project and/or multipurpose plant.**

Bioprocessing software

ROSITA and MARTA are Bionet's proprietary software, designed to monitor and control bioprocesses across multiple devices, including CELL-tainer®, with intuitive interfaces pre-installed on the system's built-in touchscreen, GMP-ready features, and real-time data insight.

 **ROSITA 2.0**



Supports bSmart Plug&Play modules

GMP-compliant

Real-time monitoring

Intuitive, user-friendly interface

Customizable rocking motion profiles

MARTA

