ESCO HEALTHCARE

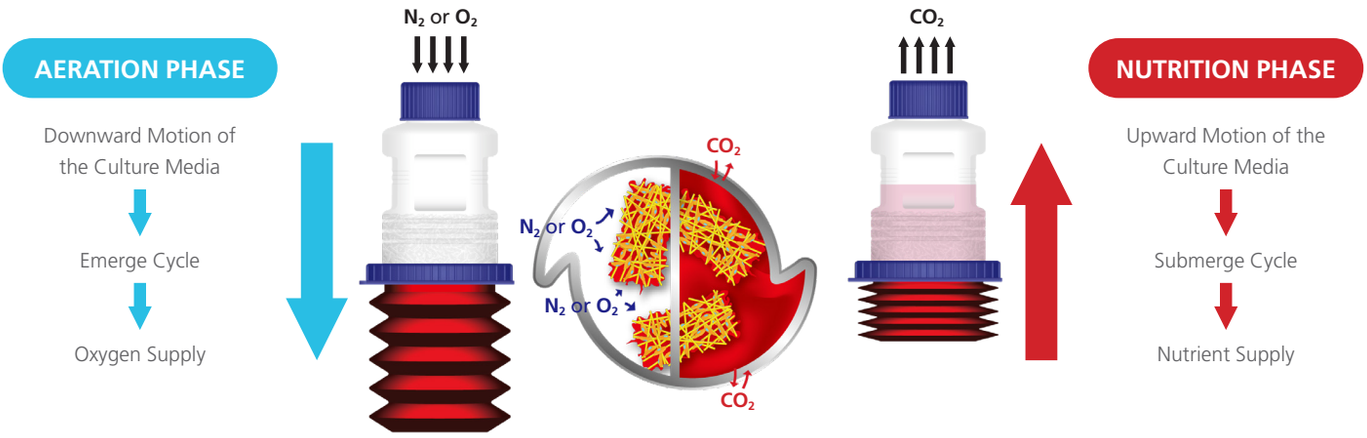
"Discovery to Delivery"

BelloCell® Single-Use Bioreactor with BelloStage™ Cell Culture Device

The Cradle for Your Cells

BelloCell® is a cost-effective, single-use, benchtop bioreactor system capable of supporting high density culture of anchorage-dependent or adherent cells. It is a ready-to-use, packed-bed bioreactor system that has linear scalability from laboratory scale to production scale, complete with automated cell harvesting system.

Tide Motion Principle in BelloCell®



BelloCell® operates through the Tide Motion principle wherein cells, attached to macroporous carriers, are alternately exposed to aeration and nutrition via the decompression and compression of the bellows holding the culture medium. The gentle vertical oscillation of the culture medium creates a dynamic interface between air and culture medium on the surface of the cells, providing the cells with an environment that is of extremely low shear stress, high aeration and nutrition levels, zero foaming, and no O_2 limitation. This efficient nutrient and oxygen transfer allow the BelloCell® system to produce high cell density and yield.

Applications

The BelloCell® can be used in many different applications, as exhibited by journal articles (see literature report on page 5). These include the following applications:

- Culture of anchorage-dependent or adherent cells
- Conversion from roller bottles to single-use, closed system
- Overcome limitations of microcarrier-stirred tank bioreactor technology
- Autologous and allogeneic cell therapy
- Human and animal vaccines
- Extracellular vesicles / exosomes
- Viral vectors / monoclonal antibodies
- Therapeutic proteins

Key Features

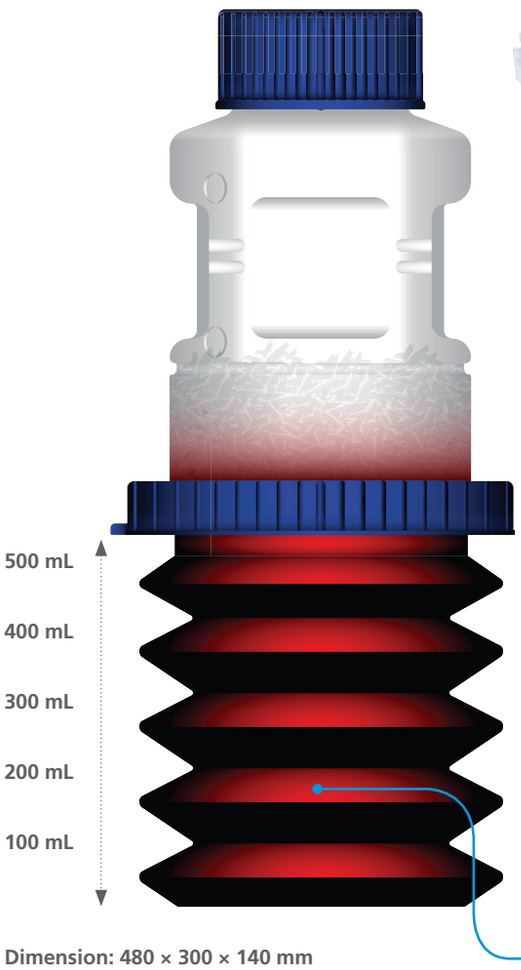
- Single-use, pre-sterilized, and ready-to-use bottles
- Compact and small footprint (standard system fits inside a 170 L or 6 ft^3 CO_2 incubator)
- Compatible with most serum-free culture medium
- Harvest whole cells or cell components
- Linear scale-up by direct multiplication of bottles or the use of TideXcell®
- Reduced labor, costs, and space requirements
- Large surface area for cell attachment and growth

Process Modes

- Batch
- Fed-batch
- Recirculation

Macroporous Carriers

Macroporous carriers are matrices that support the attachment, growth, and proliferation of adherent cell lines, including those of animal, mammalian, and insect cells.



Dimension: 480 × 300 × 140 mm
Weight: 156~175 g with different models

1.4 g (min) - 5.5 g (max) of BioNOC II®

BioNOC II®

BioNOC II® is a macroporous carrier that supports the growth of anchorage-dependent cell lines including animal, mammalian, and insect cells in either serum-containing or serum-free culture media.

Features

- Made of 100% PET
- Complies to <85>, <87>, <881>, ISO 10993-5: 2009
- High porosity (50 - 200 µm between fiber), and biocompatible to coating reagents for better attachment
- High surface area up to 15,000 cm^2 per 0.1 L packed bed volume for Vero cells
- Enhanced hydrophilicity, coating factors can be added

18 g of BioMESH®

BioMESH®

BioMESH® is a low-lint macrocarrier designed specifically for cell harvesting applications. It is suitable for use with skin fibroblasts, cardiac fibroblasts, multipotent/pluripotent stem cells, epithelial cells, and chondrocytes.

Features

- Made of a combination of polypropylene (PP) netting and PET mesh
- Complies to USP <83> <87> <788>, USP Class VI, ISO 10993-5: 2009
- High porosity (200 µm space between PET fiber; 670 µm space between PP fiber)
- High surface area for cell growth: up to 10,000 cm^2 per 0.1 L packed bed volume for MSCs
- Enhanced hydrophilicity, coating factors can be added

Culture Medium Reservoir

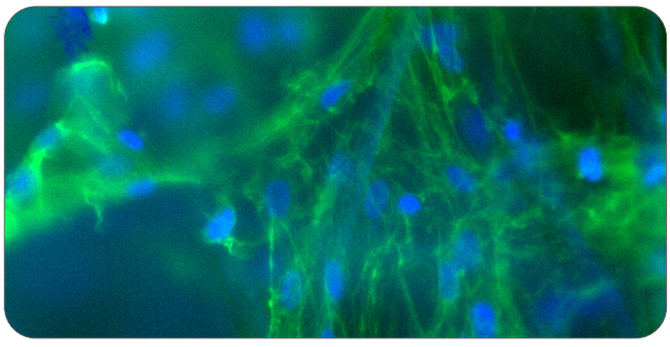
- 500 mL culture medium containing department

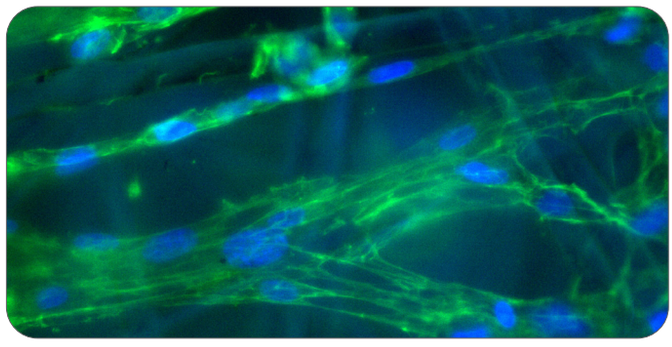
Application/ Macrocarriers	EV/Exosomes	Cell Therapy *(when harvesting the cells as final product)*	Intracellular Virus *(when harvesting the cells containing the virus)*	Secreted Bioproducts *(Virus, Viral Vectors, Proteins)*
BioNOC II®	+++	++	++	+++
BioMESH®	+++	+++	+++	++

Anchorage-dependent Cell Culture

A single BelloCell® bottle, pre-filled with 5.5 grams of BioNOC II®, offers up to 15,000 cm^2 of surface area per bottle (for Vero cells) to support cell attachment and growth. The carriers are proven to have enhanced biocompatibility, long-lasting hydrophilicity, extremely low lint waste, and excellent mechanical strength.

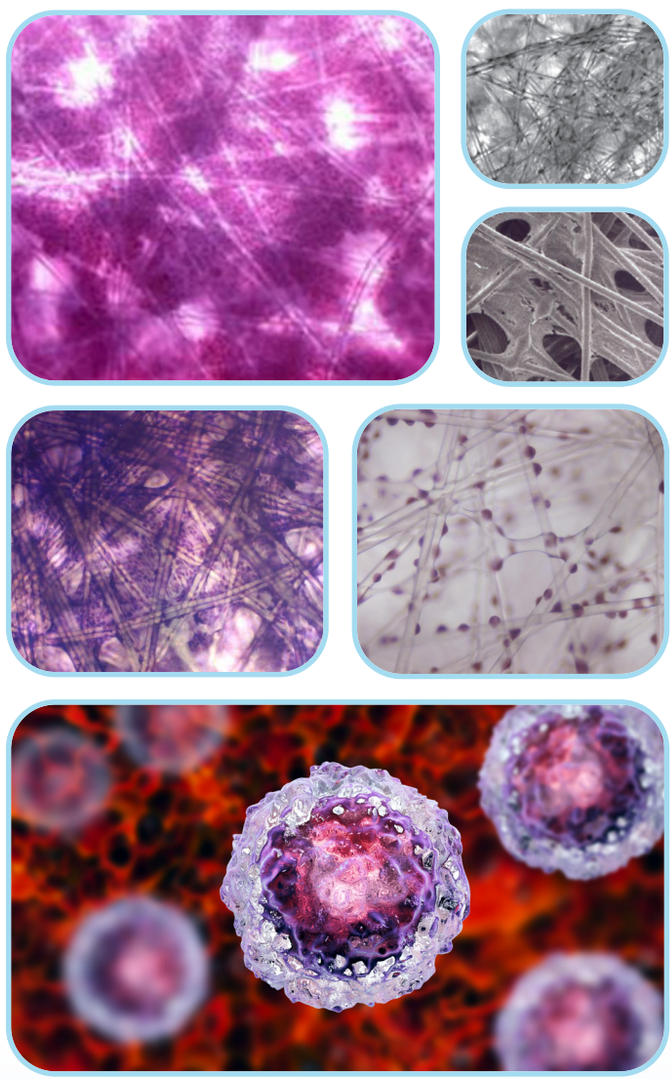
Note: surface area may vary depending on the cell line to be cultured.





FDA and Hoescht 33342-stained cells attached to the BioNOC II® carriers

Established Cell Lines	Estimated Cell Density (per Bottle)
Mammalian Cells	
BHK-21	5.5×10^9
HEK293	3.2×10^9
HeLa	1.5×10^9
MSCs	2.0×10^8
Huh-7	2.4×10^9
Hybridoma OKT 3	$3.6 - 8.9 \times 10^9$
Marc 145	4.4×10^8
MDBK	$1.5 - 2.0 \times 10^9$
MDCK	1.2×10^9
MRC5	2.5×10^8
rCHO	4.5×10^9
Vero	5.4×10^9
Insect Cells	
Hi-5	4.0×10^9
SF-9	6.3×10^9
SF-21	4.3×10^9



Established Cell Lines

Cell therapy involves the use of live whole cells and cultivating them to a certain density prior to administration for treating diseases. A commonly used cell type in cell therapy is mesenchymal stem cells, which are anchorage-dependent. Currently, cultivation of cells for cell therapy is done using T-flasks; however this method is quite laborious, time and space consuming. T-flasks have limited surface area for growth and thus, require handling of several hundred T-flasks and multiple passaging. The BelloCell® system's large surface area and compact design help solve these problems, with a single BelloCell® bottle equalling the productivity of several hundred T-flasks.

Human and Animal Vaccine

Cell culture-based vaccine production is the current trend in vaccine production as it offers several advantages over traditional vaccine production technologies including simpler mass production, rapid manufacturing, independent of SPF animal, controllable quality, and hypoallergenic products.

BelloCell® is an ideal system for laboratory-scale, cell-culture based vaccine production as it is capable of supporting high cell density culture, production of high viral titer, and linear scalability to production level. The Tide Motion bioreactor system has been used for the research and development, and production of vaccines for several indications including:

- Influenza
- JEV
- COVID-19
- Hog Cholera
- Hepatitis A
- EV71
- Rabies
- IBDV

Apart from these, the BelloCell® has also been used for other applications including recombinant protein production, pharmacokinetic studies, and cellular component production. Details of these applications can be found from literature support.

Literature Support

The following are some of the available literature support online for the various applications of the BelloCell® system.

[1] *Asaoka, Y., Tanaka, T., Tsumoto, K., Tomita, M., & Ide, T. (n.d.). Efficient expression of recombinant soluble human FcγRI in mammalian cells and its characterization. Protein Expression and Purification, 155-161.*

[2] *Brown, A., Singer, D., Mcsharry, J., Barnard, R., Hazuda, D., & Drusano, G. (n.d.). In Vitro Dose Ranging Studies for Serine Protease Inhibitor, MK-4519, Against a Hepatitis C Virus (HCV) Replicon using the Bellocell System. Antiviral Research.*

[3] *Chen, Y., Wu, J., Wang, K., Chiang, Y., Lai, C., Chung, Y., & Hu, Y. (n.d.). Baculovirus-mediated production of HDV-like particles in BHK cells using a novel oscillating bioreactor. Journal of Biotechnology, 135-147.*

[4] *Drugmand, J., J.-F., J., Agathos, S., & Schneider, Y. (n.d.). Growth of Mammalian and Lepidopteran Cells on BioNOC II® Disks, a Novel Macroporous Microcarrier. Cell Technology for Cell Products, 781-784.*

[5] *Hammonds, J., Chen, X., Zhang, X., Lee, F., & Spearman, P. (n.d.). Advances in methods for the production, purification, and characterization of HIV-1 Gag–Env pseudovirion vaccines. Vaccine, 8036-8048.*

[6] *Ho, L., Greene, C., Schmidt, A., & Huang, L. (n.d.). Cultivation of HEK 293 cell line and production of a member of the superfamily of G-protein coupled receptors for drug discovery applications using a highly efficient novel bioreactor. Cytotechnology, 117-123.*

[7] *Hu, Y., Lu, J., & Chung, Y. (n.d.). High-density cultivation of insect cells and production of recombinant baculovirus using a novel oscillating bioreactor.Cytotechnology, 145-153.*

[8] *Huang, K., Lo, W., Chung, Y., Lai, Y., Chen, C., Chou, S., & Hu, Y. (n.d.). Combination of Baculovirus-Mediated Gene Delivery and Packed-Bed Reactor for Scalable Production of Adeno-Associated Virus. Human Gene Therapy, 1161-1170.*

[9] *Lu, J., Chung, Y., Chan, Z., & Hu, Y. (n.d.). A Novel Oscillating Bioreactor BelloCell: Implications for Insect Cell Culture and Recombinant Protein Production. Biotechnology Letters Biotechnol Lett, 1059-1065.*

[10] *Mcsharry, J., Singer, D., Kulawy, R., Brown, A., & Drusano, G. (n.d.). Use of the BelloCell System to Determine the Optimal Dose of Ribavirin to Inhibit the Expression of an HCV Replicon in 2209-23 Cells. Antiviral Research.*

[11] *Toriniwa, H., & Komiya, T. (n.d.). Japanese encephalitis virus production in Vero cells with serum-free medium using a novel oscillating bioreactor.Biologicals, 221-226.*

Conversion From Roller Bottle to Single-use, Closed System Cell Culture

The roller bottle system plays a major role in cell culture-based vaccine production as it is easy to operate, has a simple scale-up method, observable cell growth and cytopathic effect (CPE), and limited contamination. However, the system has many limitations including intensive labor, large space requirement, high running costs, and low efficiency of culture medium utilization.

In principle, the roller bottle system is very similar to BelloCell® system. In both systems, cells are alternately exposed to aeration and nutrition. BelloCell®, however, can overcome the limitations of the roller system while improving output. The advantages of the BelloCell® system over the roller bottle include:

- One BelloCell® system is equivalent to eighty (80) roller bottles
- Reduced labor and space requirements
- More controllable
- Reduced contamination risks
- Cell harvest in a closed system
- More efficient use of culture medium
- Higher cell density and viral titer

1 BelloStage™ accomodates 4 BelloCell® Bottles

Roller Bottles
850 cm²

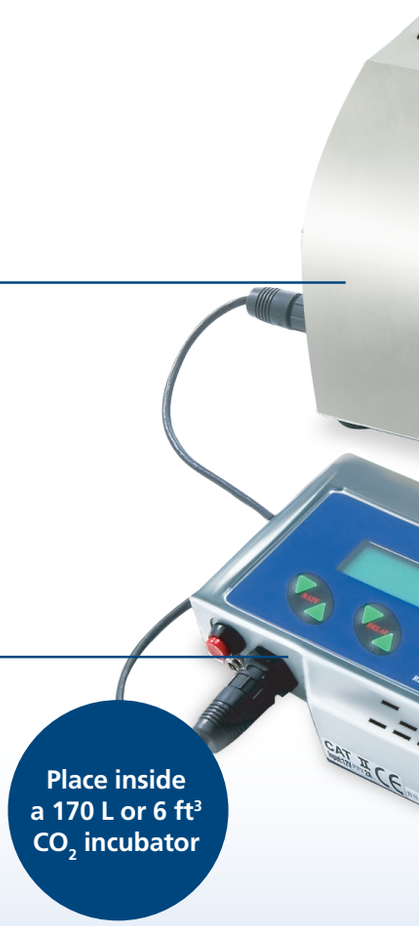
BelloCell® System Complete

BelloCell® system is simple to operate and virtually no learning curve. BelloCell® 500A bottle is placed in the BelloCell® unit stage for batch and semi-batch operation where process components are easily traceable.

Filtered Cap
0.22 µm ventilation filter provided in the cap

BelloStage™
Stainless Steel 304 L Carcass that can hold up to 4 BelloCell® bottles.

Controller
Magnetized back for convenient positioning on the side or on the front of a CO_2 Incubator.



Place inside a 170 L or 6 ft³ CO_2 incubator

Overcome Limitations of Microcarrier-Stirred Tank Bioreactor Technology

Another technology used for the culture of adherent cells is the use of microcarriers, specially-treated micro-beads where cells attach to and grow on. The microcarriers are suspended in culture medium in stirred tank bioreactors where the medium is continuously agitated and parameters are automatically monitored and controlled. The microcarrier technology, however, has several disadvantages including reduced cell attachment efficiency, shear stress, foaming, and lack of linear scalability, all of which the BelloCell® system are able to overcome.

The BelloCell® system also has improved features compared to the microcarrier system in terms of the following:

- Viral titer and cell density
- Cell harvest efficiency
- Culture medium usage efficiency

1 BelloStage™ accomodates 4 BelloCell® bottles

Spinner Flask
500 mL

BioNOC II® or BioMESH® macroporous carriers

Cells remain entrapped in the carriers simplifying media replacement and product harvesting.

Polypropylene (PP)

PP demonstrates strong mechanical properties, offers outstanding resistance to a variety of chemicals, can endure moderate temperatures, and is biocompatible.

Polyethylene Terephthalate Glycol (PETG)

PETG displays robust tensile characteristics, is recognized for its glass-like transparency, and displays good resistance to a range of chemicals. Additionally, remains stable at moderate temperatures and is biocompatible.

Low-Density Polyethylene (LDPE) and Ethylene Vinyl Acetate (EVA)

The combination of LDPE and EVA demonstrates significant flexibility and excellent elasticity, provides good resistance to various acids bases, and is biocompatible.

Compressible Bellows

Compresses for nutrition and decompresses for aeration.

Note: We offer bottles containing either half-filled or quarter-filled macrocarrier options to suit your requirements. For more details, please refer to the ordering information on page 16.

BelloCell® Continuous System Complete

Same BelloCell® unit stage but utilizes BelloCell® -500AP bottle for recirculation/continuous processes.

Each BelloCell® system accomodates up to four single-use bottles, making this an ideal screening device to test varying medium formulations or cell lines.

No steam or water lines, autoclave or utilities required, just a power outlet and CO_2 incubator

Fits in a 240 L or 8.5 ft^3 CO_2 incubator

BelloStage™ Stage

Stainless steel 304 L Carcass that can hold up to 4 BelloCell® bottles.

Dimension	264 (W) × 359 (L) × 170 (H) mm (10.4 × 14 × 6.7 inches)
Weight	7.0 kg (15.4 lbs)
Power	100~230 VOLTS AC, 50/60 Hz (Input); 12 VOLTZ DC (Output)
Up-Down Rate	0.25 to 2.0 mm/sec. Step of 1.0 sec or 1.0 min.
Delay Time	0 to 99 min 59 sec Step of 1.0 sec or 1.0 min.
Driver Motor	DC stepping-motor
Environment	20~42 °C, 0~90% relative humidity (in a CO_2 incubator)
Mechanical Protection	Hi-Low Optical Sensor
Transmission	Gear set (ratio 1:1.2) and belt
Materials	Aluminum alloy, chromic steel
Recommended CO_2 incubator dimension	CCL-170 L model: 505 × 535 × 633 mm (19.9" × 21.1" × 24.9") and CCL-240 L model: 595 × 640 × 633 mm (23.4" × 25.2" × 24.9")

BelloFeeder™

Enables four-pump operation with individual programming setting.

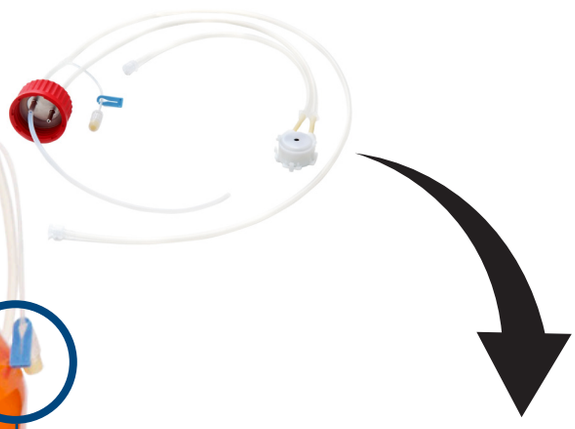
Media Reservoir

Fresh culture medium bottle in either 1 L or 2 L volume.

Note: Media reservoir bottles are NOT sold with the package. Please buy locally.

Tubing Complete Set (Connection Set)

Connects the media reservoir bottle to the BelloCell® bottle.



Disposable Tubing Set and Pump Head

Replacement tubings and pump head for tubing complete set (connection set).

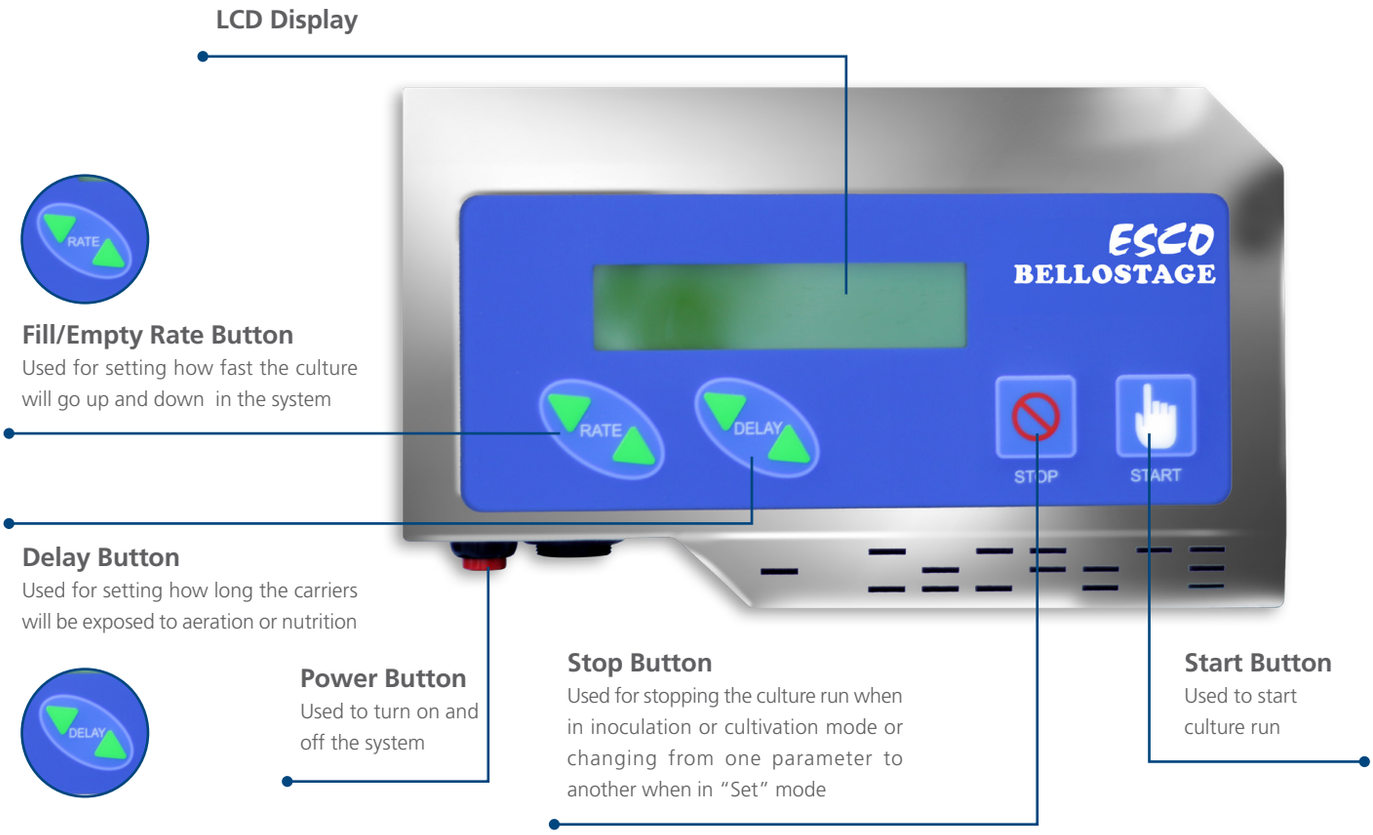
Culture Medium Sampling Port

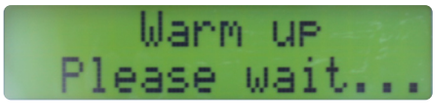
Needleless closed sampling for cell culture growth monitoring.

Pump Head

Calibration-free single-use pump head for up to three times to support consistent feeding rate.

The Main Controller





Message displayed on screen once controller is turned on

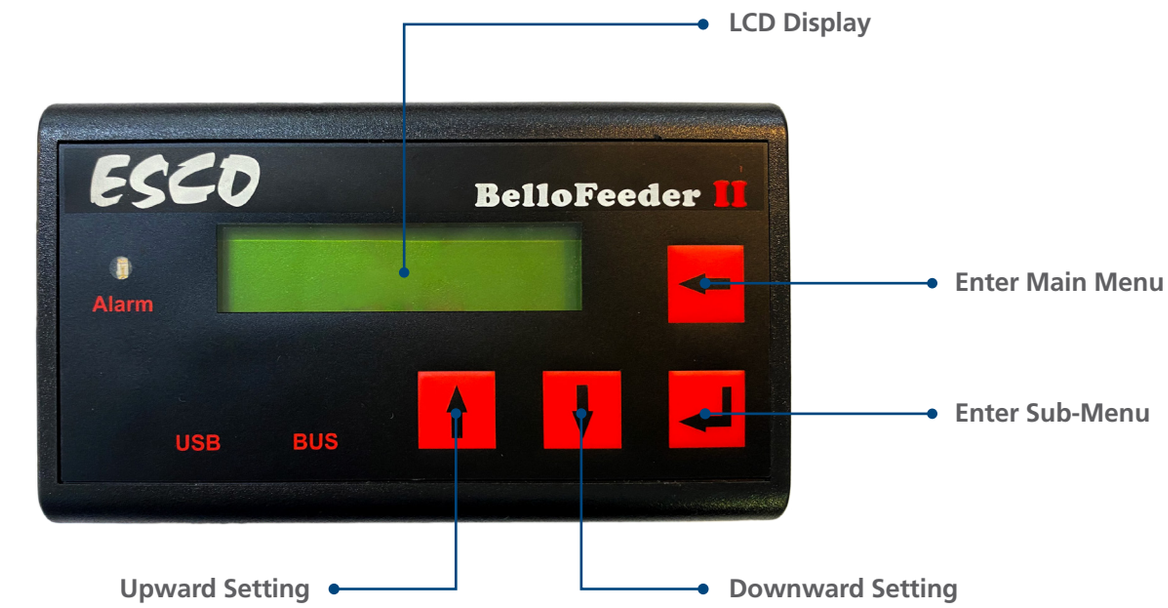
Message that will be displayed when stage is rendered on top before opening

Display message after system has warmed up

Dimension	226 (W) × 40 (D) × 137 (L) mm (5.4 x 8.9 × 1.6 inches)
Weight	1.16 kg (2.6 lbs)
Power	100~230 volts AC 50/60 Hz (Input); 12 volts DC (Output)
Environment	Room temperature (outside CO_2 incubator)
Materials	Magnetic back plate, to hold the controller to the side of the incubator.

The BelloFeeder™ Pump

BelloFeeder™ is a microprocessor-controlled pumping unit of the BelloCell® Continuous Complete or other cell culture systems. It is designed to simplify user's operation such that daily feeding volume and frequency of the feeding are the only two parameters required. It simplifies setup work by avoiding calibration and calculation as usually needed in conventional peristaltic pumps.



Key Features

- Controls five (5) peristaltic pumps individually
- Controls five (4) recirculation process of BelloCell®-500AP or 500P bottles at a time
- Daily feeding rate ranges from 0-2999 mL/day
- Feeding frequency of 1-24 times per day
- Pump calibration made possible to improve accuracy

Specifications

Controller	
Dimension	125 (L) × 75 (W) × 32 (H) mm
Weight	0.50 kg
Environment	Ambient to 45˚C, 0~95 % relative humidity

Pump Console	
Dimension	125 (L) × 75 (W) × 32 (H) mm
Weight	0.50 kg
Power	100~240 Volts AC, 50/60 Hz (Input); ~1.6 A
Environment	Ambient to 45˚C, 0~95 % relative humidity

Single-Use and Ready-to-Use BelloCell® Bottles

BelloCell® bottles are sterilized through gamma irradiation and come pre-packed with 5.5 grams of carriers as standard. Different models of bottles cover a specific application in cell culture.

BelloCell® -500A

Suitable for cell harvest, transient transfection, slow adhering cells; batch/semi-batch culture

BelloCell® -500AP

Suitable for cell harvest, transient transfection, slow adhering cells; continuous culture

Application/Bottle	Item Code	EV/Exosomes	Cell Therapy *(when harvesting the cells as final product)*	Intracellular Virus *(when harvesting the cells containing the virus)*	Secreted Bioproducts *(Virus, Viral Vectors, Proteins)*
BelloCell® -500A BioNOC II	1400003	+++	++	++	+++
BelloCell® -500AP BioNOC II	1400004	+++	++	++	+++
BelloCell® -500A BioMESH	1400295	+++	+++	+++	++
BelloCell® -500AP BioMESH	1400303	+++	+++	+++	++

Cell Monitoring

GlucCell™

A portable, easy-to-use, calibration-free glucose monitoring system for cell culture. Get results in just 15 seconds. Sample with just 1.5 uL culture medium with measurement range from 30-500 mg/dL.

Crystal Violet Dye

A simple tool for the quantification of cells based on the number of nuclei dyed. The CVD kit contains reagents that disrupt the cells, thereby releasing the nuclei, which are subsequently dyed.

Note: CVD is not recommended for counting stem cells or VERO cells. Use fluorescence dyes to achieve better cell observation.

Carrier Sampling

500A/500AP Bottles

Adherent cells attached to the macroporous carriers can be monitored through carrier sampling. The bottle is opened inside a biosafety cabinet and using a sterile forceps, carriers can be taken out for cell count, cell staining and monitoring.

Inoculation Phase pH Control

OPTION 1

If using a pre-mixed media with fixed amount of sodium bicarbonate ($NaHCO_3$), readjusting before culture may be difficult. Alternatively, users can opt to:

For Upright Seeding

Seed at 5% or higher CO_2 concentration

For Inverted Seeding

Adjust pH with hydrochloric acid (HCl) to pH 6.8-7 as a starting point

OPTION 2

Use 500AP bottle and connect one tubing with air filter and the other leaving tightly closed.

Note: White caps are available for purchase separately

OPTION 3

Compress the bellows before closing the bottles with a non-vented cap (white cap). This method lessens excessive air in the BelloCell® bottle which may affect the pH value of the culture medium. This can be attributed to the decrease of CO_2 concentration in the liquid rendering it basic.

Ordering Information

Item Code	Product Name	Package
	Unit	
2230006	BelloCell® System Complete	System Inclusive of: 1× Control Box 1× Power Adapter (100~240V) 1× Signal Cable 2× Forceps 1× CVD (Crystal Violet Dye) kit (50 mL) 1× GlucCell Glucose Monitoring System 1× GlucCell Glucose Meter 2× Glucose Test Strip Bottles (1 Box - 14000010)
2230007	BelloCell® Continuous System Complete	System Inclusive of: 1× BelloCell Stage 1× Control Box 1× Power Adapter (100~240V) 1× Signal Cable 2× Forceps 1× CVD (Crystal Violet Dye) kit (50 mL) 1× GlucCell Glucose Monitoring System 1× Celfeeder Pump 1× Tubing Complete Set (1 Bottle - 1 Set, autoclavable)
2230005	BelloStage™	1× Main Console 1× Control Box 1× 100-240 V Power Adapter 1× Signal Cable 2× Forceps 1× Crystal Violet Dye Nucleus Count Kit
1400067	BelloFeeder™ Pump	1× BelloFeeder™ Pump
	Consumables	
1400003	500-A BioNoc II® (Batch, Upright)	1× BelloCell®-500A prefilled with 0.1 L BioNOC II® (pack of 4)
1400297	500-AH BioNoc II® (Batch, Upright)	1× BelloCell®-500A prefilled with 0.05 L BioNOC II® (pack of 4)
1400298	500-AQ BioNoc II® (Batch, Upright)	1× BelloCell®-500A prefilled with 0.025 L BioNOC II® (pack of 4)
1400295	500-A BioMESH® (Batch, Upright)	1× BelloCell®-500A prefilled with 0.1 L BioMESH® (pack of 4)
1400299	500-AH BioMESH® (Batch, Upright)	1× BelloCell®-500A prefilled with 0.05 L BioMESH® (pack of 4)
1400300	500-AQ BioMESH® (Batch, Upright)	1× BelloCell®-500A prefilled with 0.05 L BioMESH® (pack of 4)
1400004	500-AP BioNoc II (Recirculation, Inverted)	1× BelloCell®-500AP prefilled with 0.1 L BioNOC II® (pack of 4)
1400301	500-APH BioNoc II (Recirculation, Inverted)	1× BelloCell®-500APH prefilled with 0.05 L BioNOC II® (pack of 4)
1400302	500-APQ BioNoc II (Recirculation, Inverted)	1× BelloCell®-500APQ prefilled with 0.025 L BioNOC II® (pack of 4)
1400303	500-AP BioMESH® (Recirculation, Inverted)	1× BelloCell®-500AP prefilled with 0.1 L BioMESH® (pack of 4)
1400304	500-APH BioMESH® (Recirculation, Inverted)	1× BelloCell®-500AP prefilled with 0.05 L BioMESH® (pack of 4)
1400305	500-APQ BioMESH® (Recirculation, Inverted)	1× BelloCell®-500AP prefilled with 0.025 L BioMESH® (pack of 4)
1400011	Tubing Complete Set	1× Tubing Set 1× Pump Head 1× Head Plate
1400012	Disposable Tubing Set & Pump Head	1× Tubing Set 1× Pump Head
1400013	Disposable Tubing Accessory	5× Tubing Set
1400009	GlucCell™ Glucose Monitoring System	1× GlucCell™ Glucose meter 2 bottles of Glucose Test Strip (1bt = 25 test strips)
1400010	GlucCell™ Glucose Test Strip	1× Glucose Test Strip bts (2 × 25 pcs)
1400014	Crystal Violet Dye Nucleus Count Kit	1× CVD Bottle (100 ml/bt)
1400015	Filtered Cap	(Pack of 6)
1400016	Non-Vented Cap	(Pack of 8)
1400017	Forceps	Used for sampling of carriers
1400021	BelloCell® Strainer	Single-use Strainer (Pack of 10)

BelloCell® and Esco CO_2 Incubator

The Perfect Combination for High Density Adherent Culture

BelloCell® system can be incorporated into an existing CO_2 incubator or can be purchased with an Esco CO_2 incubator. Esco offers a wide range of CO_2 incubators that suit clients' different requirements, provide superior performance and cell protection.

CelCulture® CO_2 Incubator

Sleek, reliable, and intuitive, Esco CelCulture® CO_2 incubators provide all-rounded sample protection that brings your scientific dreams one step closer to reality.

Features:

- HPA-validated 90°C overnight moist heat decontamination cycle
- Rounded corners and seamless design for easy cleaning
- Constructed using electrogalvanized with ISOCIDE™ powder-coating to eliminate 99.9% of surface bacteria within 24 hours of exposure
- With optional copper interiors for added antimicrobial protection
- Available in 50 L, 170 L, and 240 L sizes
- ULPA Filter
  - 99.999% efficient, superior to conventional HEPA filters
  - Filters air continuously
  - Chamber returns to ISO Class 5 cleanliness in 11 minutes upon door closing to prevent contamination
- Direct Heat & Air Jacket
  - Fast and uniform heating
  - Rapid temperature recovery without overshoot
  - Air jacket improves chamber stability
- O_2 Sensor (for suppressed O_2 Model)
  - Long life
  - Stable output signal
  - No influence from CO_2
- CO_2 Sensor
  - BelloStage® and CO_2 Incubator Combination
  - Single-beam, dual-wavelength IR sensor is drift-free

  - Auto-zeroing
- SmartSense™ Microcontroller Interface
  - Intuitive, fully equipped control and monitoring system

CelCulture® CO_2 Incubators IR Sensor Model with Stainless Steel Chamber				
230 VAC, 50/60 Hz		115 VAC, 50/60 Hz		Description
Item Code	Model	Item Code	Model	
2170034	CCL-050B-8	2170054	CCL-050B-9	CelCulture® Incubator, 50 L, IR sensor, CO_2 Control, Moist Heat Decon (Without Decon Pump)
2170002	CCL-170B-8	2170004	CCL-170B-9	CelCulture® Incubator, 170 L, IR sensor, CO_2 Control, ULPA, Moist Heat Decon
2170068	CCL-170B-8-NF	2170075	CCL-170B-9-NF	CelCulture® Incubator, 170 L, IR sensor, CO_2 Control, Moist Heat Decon (No ULPA Filter)
2170058	CCL-240B-8	2170060	CCL-240B-9	CelCulture® Incubator, 240 L, IR sensor, CO_2 Control, ULPA, Moist Heat Decon
2170069	CCL-240B-8-NF	2170079	CCL-240B-9-NF	CelCulture® Incubator, 240 L, IR sensor, CO_2 Control, Moist Heat Decon (No ULPA Filter)

CelCulture® CO_2 Incubators Suppressed O_2 Models with Stainless Steel Chamber				
230 VAC, 50/60 Hz		115 VAC, 50/60 Hz		Description
Item Code	Model	Item Code	Model	
2170055	CCL-050T-8	2170056	CCL-050T-9	CelCulture® Incubator, 50 L, IR sensor, CO_2 Control, Moist Heat Decon (Without Decon Pump)
2170047	CCL-170T-8	2170048	CCL-170T-9	CelCulture® Incubator, 170 L, IR sensor, CO_2 & O_2 Control, ULPA, Moist Heat Decon
2170070	CCL-170T-8-NF	2170076	CCL-170T-9-NF	CelCulture® Incubator, 170 L, IR sensor, CO_2 & O_2 Control, Moist Heat Decon (No ULPA Filter)
2170061	CCL-240T-8	2170062	CCL-240T-9	CelCulture® Incubator, 240 L, IR sensor, CO_2 & O_2 Control, ULPA, Moist Heat Decon
2170071	CCL-240T-8-NF	2170080	CCL-240T-9-NF	CelCulture® Incubator, 240 L, IR sensor, CO_2 & O_2 Control, Moist Heat Decon (No ULPA Filter)

CelCulture® CO_2 Incubator with Stainless Steel Exterior Cabinet

The Esco CelCulture® CO_2 incubator is also available with stainless steel exterior with the same superior features.

Features:

- Corrosion Resistant Surface
- Meets Pharmaceutical and Clinical Laboratory Requirements
- HPA-validated 90°C overnight moist heat decontamination cycle
- ISO Class 5 cleanliness via ULPA Filter System
- Available in 50 L, 170 L and 240 L sizes

Ordering Information

IR SENSOR MODEL WITH STAINLESS STEEL EXTERIOR CABINET		
Models	**Item Code**	**Description**
CCL-050B-8-SS	2170128	CelCulture® Incubator 50 L, IR Sensor, CO_2 Control, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz (Without Decon Pump)
CCL-170B-8-SS	2170065	CelCulture® Incubator 170 L, IR Sensor, CO_2 Control, ULPA, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz
CCL-240B-8-SS	2170137	CelCulture® Incubator 240 L, IR Sensor, CO_2 Control, ULPA, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz
CCL-050B-9-SS	2170176	CelCulture® Incubator 50 L, IR sensor, CO_2 Control, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz (Without Decon Pump)
CCL-170B-9-SS	2170177	CelCulture® Incubator 170 L, IR Sensor, CO_2 Control, ULPA, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz
CCL-240B-9-SS	2170140	CelCulture® Incubator 240 L, IR Sensor, CO_2 Control, ULPA, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz

SUPPRESSED O_2 MODEL WITH STAINLESS STEEL EXTERIOR CABINET		
Models	**Item Code**	**Description**
CCL-050T-8-SS	2170171	CelCulture® Incubator 50 L, IR Sensor, CO_2 & O_2 Control, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz (Without Decon Pump)
CCL-170T-8-SS	2170129	CelCulture® Incubator 170 L IR Sensor, CO_2 & O_2 Control, ULPA, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz
CCL-240T-8-SS	2170138	CelCulture® Incubator 240 L, IR Sensor, CO_2 & O_2 Control, ULPA, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz
CCL-050T-9-SS	2170178	CelCulture® Incubator 50 L, IR Sensor, CO_2 & O_2 Control, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz (Without Decon Pump)
CCL-170T-9-SS	2170179	CelCulture® Incubator 170 L, IR Sensor, CO_2 & O_2 Control, ULPA, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz
CCL-240T-9-SS	2170141	CelCulture® Incubator 240 L, IR Sensor, CO_2 & O_2 Control, ULPA, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz

CelCulture® CO_2 Incubator with Cooling System

Esco CelCulture® CO_2 Incubator with Integrated Cooling System provides solution for highly specialized application. The integrated cooling system allows studies of samples that requires temperature at/or below ambient temperature.

Features:

- Wider temperature range of 8°C below ambient to 60°C above ambient
- Highly efficient, environment friendly Peltier Cooling System
- Constructed using electrogalvanized with ISOCIDE™ powder-coating to eliminate 99.9% of surface bacteria within 24 hours of exposure
- Complete contamination control methods
  - 90°C Validated Moist Heat Decontamination Cycle
  - ULPA Filter
  - 0.2 μm inlet filter
- Available in 170 L and 240 L sizes

GUIDE TO MODELS, CelCulture® CO_2 Incubators with Cooling System				
IR Sensor Model With Stainless Steel Chamber				
230 VAC, 50/60 Hz		115 VAC, 50/60 Hz		Description
Item Code	Model	Item Code	Model	
2170101	CCL-170B-8-P	2170115	CCL-170B-9-P	CelCulture® Incubator, 170 L, IR sensor, CO_2 control, Moist Heat Decon, Peltier System
2170116	CCL-240B-8-P	2170266	CCL-240B-9-P	CelCulture® Incubator 240 L, IR Sensor, CO_2 Control, Moist Heat Decon, Peltier System

Suppressed O_2 Models with Stainless Steel Chamber				
230 VAC, 50/60 Hz		115 VAC, 50/60 Hz		Description
Item Code	Model	Item Code	Model	
2170112	CCL-170T-8-P	2170153	CCL-170T-9-P	CelCulture® Incubator, 170 L, IR sensor, CO_2 control, O_2 control, Moist Heat Decon, Peltier System
2170267	CCL-240T-8-P	2170268	CCL-240T-9-P	CelCulture® Incubator 240 L, IR Sensor, CO_2 & O_2 Control, Moist Heat Decon, Peltier System

cGMP Scale Out Strategy

Esco Healthcare facilitates seamless technology transfer, scaling out from research-use-only applications to GLP toxicology studies and cGMP/GMP production, transitioning efficiently from BelloStage®/ BelloCell® platforms to CelCradle® and CelCradle®+ systems.

For innovators seeking a capex light, Esco Aster leverages its CelCradle bioreactors to provide cGMP CRDMO services. These services enable technology transfer, transitioning processes from Research Use Only (RUO) laboratory bench applications to GLP and the production of clinical trial materials cGMP bedside.

BelloStage® / BelloCell®

** BelloStage® / BelloCell® uses independent CO_2 incubator.*

Research-use Only/ For Further Manufacturing

CelCradle®

CelCradle® +

cGMP/GMP Manufacturing

Highest Yield. Affordable Cost. Linearly Scalable.

A single BelloCell® bottle replaces hundreds of petri dishes, tissue culture flasks, and dozens of spinner flasks, roller bottles, and more.

1 BelloStage® accomodates 4 BelloCell® bottles

Roller Bottles
850 cm²

Spinner Flask
500 ml

Plates
6320 cm²

Petri Dish
180 cm²

Flask
150 cm²

- Air Shower
- Aseptic Containment Isolator (ACTI)
- Ceiling Laminar Airflow Units
- Cleanroom Transfer Hatch
- Containment Barrier Isolator (CBI)
- Downflow Booth (DFB)
- Dynamic Floor Laminar Hatch
- Dynamic Pass Box
- Evidence Drying Cabinet
- Garment Storage Cabinet
- General Processing Platform Isolator (GPPI)
- Laminar Flow Horizontal Trolley
- Laminar Flow Straddle Units, Single and Double
- Laminar Flow Vertical Trolley
- Pass Box
- Soft Wall Cleanroom
- Sputum Booth
- Ventilated Balance Enclosure (VBE)
- Weighing and Dispensing Containment Isolator (WDCI)

Since 1978, Esco has emerged as a leader in the development of controlled environment, laboratory and pharmaceutical equipment solutions. Products sold in more than 100 countries include biological safety cabinets, fume hoods, ductless fume hoods, laminar flow clean benches, animal containment workstations, cytotoxic cabinets, hospital pharmacy isolators, and PCR cabinets and instrumentation. With the most extensive product line in the industry, Esco has passed more tests, in more languages, for more certifications, throughout more countries than any biosafety cabinet manufacturer in the world. Esco remains dedicated to delivering innovative solutions for the clinical, life science, research and industrial laboratory community.

ESCO HEALTHCARE | "Discovery to Delivery"

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