



Designed in  
Singapore



TideXcell™-002 Model

# TideXcell™

The Gentle Giant of  
Adherent Bioprocessing

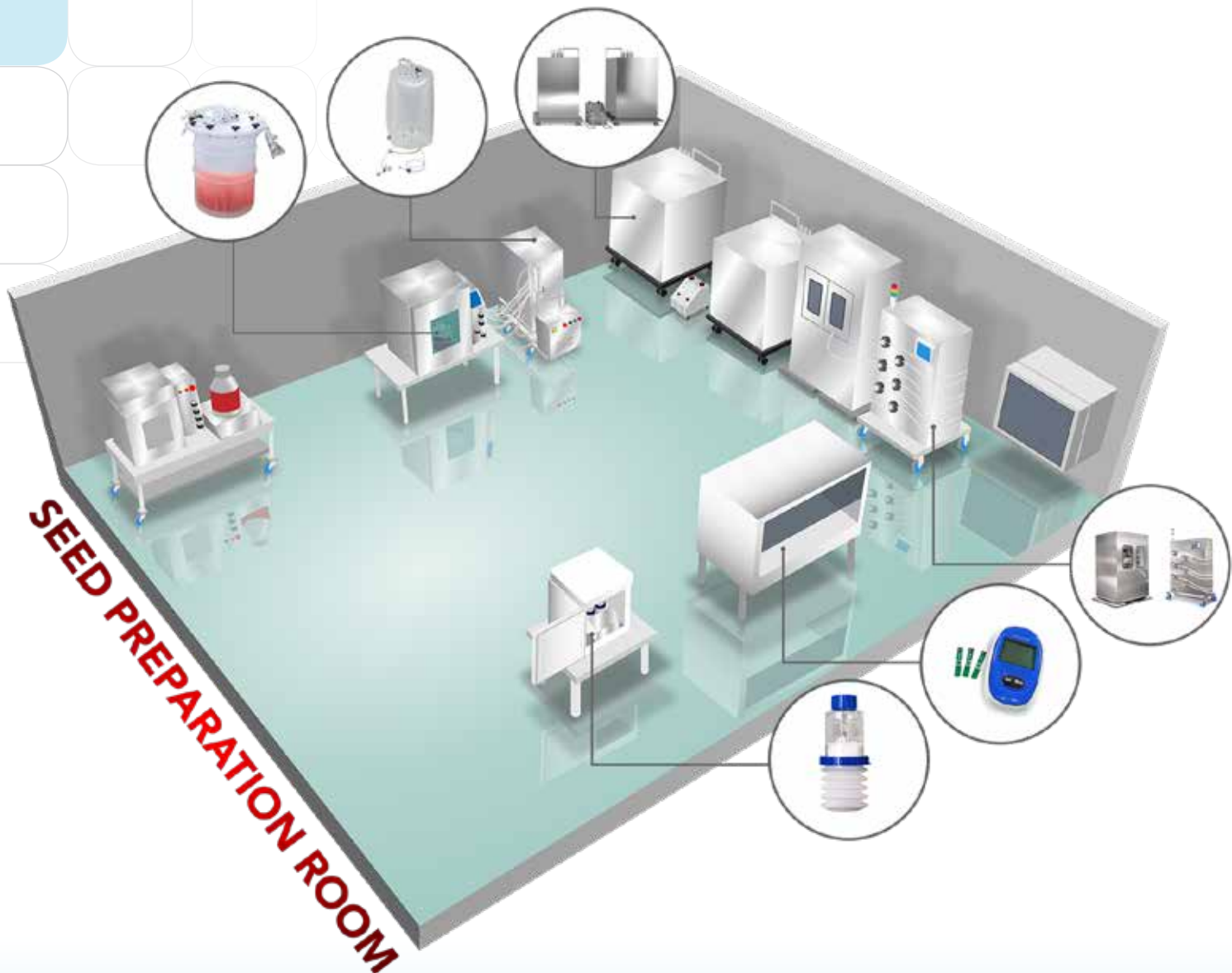


ESCO  
VACCI X CELL  
ADHERENT BIOPROCESSING SPECIALIST

# TideXcell™

## The Gentle Giant of Adherent Bioprocessing

TideXcell™ is a linearly scalable bioreactor that runs on a patented Tide Motion principle for adherent cell bioprocessing. Single-use or multiple-use vessels of 2 L, 20 L, and 100 L are available. TideXcell™ is ideal for biomass expansion of adherent cells or recovery of intracellular virus, equipped with closed cell harvesting system that has a recovery rate of >90%. TideXcell™ is integrated with desirable and advanced features such as pH and DO (Dissolved Oxygen) measurement capability, Siemens HMI PLC-based monitoring and control system with optional connection to SCADA (Pcs7/DeltaV/Wonderware). Its compressed air path comes with a double HEPA and VOC (volatile organic chemicals) filters as well as in line UV-C and other optional features such as mass flow controllers.



► TideXcell™ is an ideal platform for many different applications:

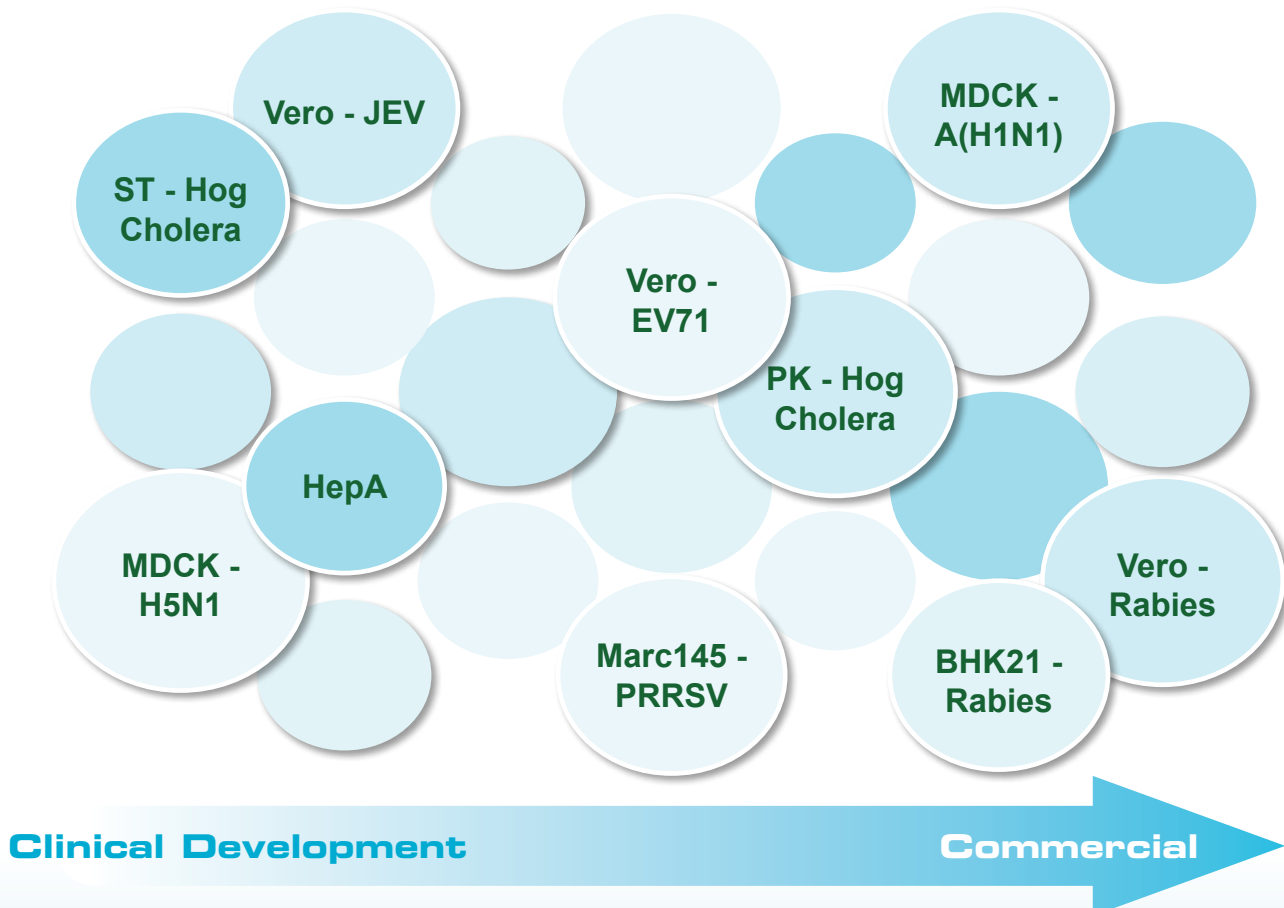
- Culture of anchorage-dependent cells with BioNOC™ II carriers
- Transition from 2D roller bottle, multilayer cultureware system to closed 3D system
- Cell mass train
- Continuous bioprocessing
- Vaccine production
- Wild virus production
- Recombinant protein and monoclonal antibody production for diagnostic/biologics
- Cell therapy
- Biosimilars and biobetters
- Biologics for neglected tropical diseases and orphan diseases

► System Advantage:

- Can be single-use or multiple-use
- Adherent cell scale-up for up to 5,000 L packed-bed volume (bio-equivalency of 50,000 L in suspension)
- A 100% media exchange system ideal for continuous bioprocessing
- Separation of the matrix and mixing vessel permits dual temperature control process to produce higher virus titers
- Built-in weighing platform and in-house mixer
- CSV 21 cfr Part 11 Compliant GAMP 5 PLC based monitoring system with simple, intuitive touchscreen
- Can be connected to SCADA systems using DeltaV, Pcs7, Wonderware, or Mitsubishi or others as per client request
- Optional dual redundant systems for critical components such as PLC and pumps pH/DO sensors between the matrix and mixing vessel
- Provides an ultra-scale down process and reduces costs by saving on media, labor, space, utilities, and most importantly, eliminates cross-contamination
- Isolator capability
- cGMP references
- PAT/IPQC

## Proven Cell Lines and Indications

Esco TideXcell™ has been used for various human and animal commercial vaccines for PICs, eu cGMP and JIS factories globally as well as vaccines, cell-,gene therapy, viral vectors, oncolytic viruses, exosomes are in various stages of clinical development. See Vaccixcell's cell lines and indications below:



## Key Benefits

TideXcell™ utilizes the Tide Motion principle which is the gentle upward and downward motion of the culture medium in the matrix vessel. BioNOC™ II macrocarriers are alternately exposed to nutrition and oxygen so cells attached to these macrocarriers will not experience shear stress, resulting to minimal to zero cell debris.



*\*Scaled-down proof of concept*

*CelXrocker™ is a system used for trying out carriers of minimal amounts in a 2D system using Tide Motion principle.*



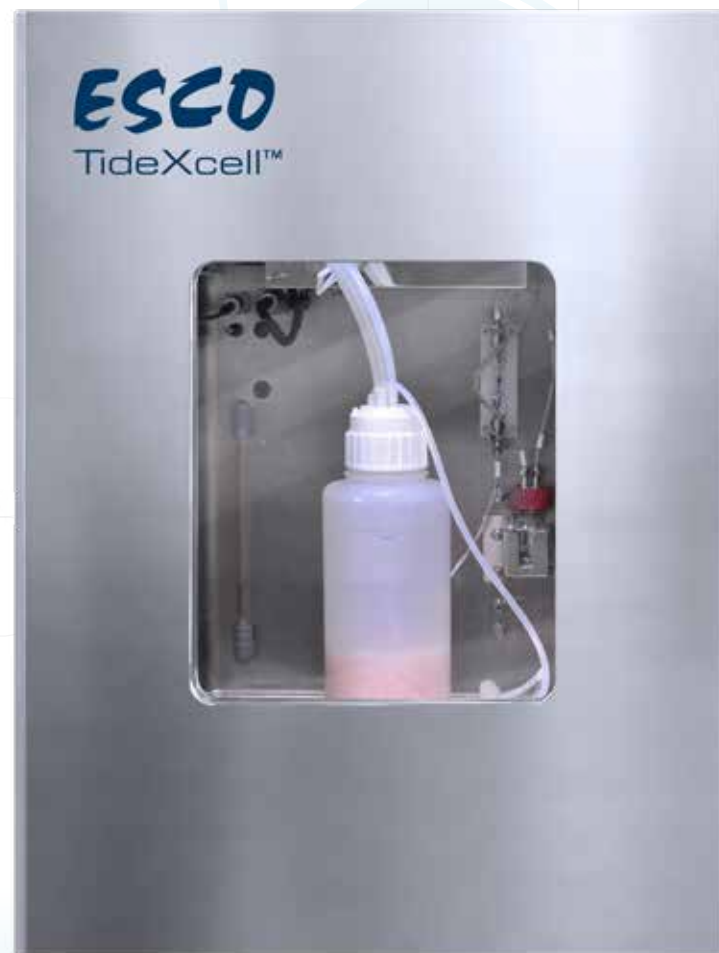
*\* Yield can be at times higher than even suspension culture since media can be 100% media exchanged, allowing immediate 100% fresh new media exchange after cells are cultured to confluence.*

Furthermore, cells lysed after viral infection will remain trapped within the matrices; hence, these cells will not be flushed into the harvest media during Tide Motion. This reduces host cell protein, DNA/RNA nucleic acid residues by several folds.

## Highest Yield

The heart of the TideXcell™ system is the BioNOC™ II, which is made from 100% PET fibrous culture matrix with stability of up to 5 years. These macrocarriers provide cells with a large surface area for attachment and growth. The 3D matrix closely mimics a cell's *in vivo* environment. In addition, the efficient oxygenation and nutrition exchange in the matrix vessel allow cells to proliferate well and produce high yields of bioproducts.

Multiple harvest for secreted viruses can be done (e.g. Hog cholera vaccine).





## Lowest Cost

Space, utilities, and labour requirements are lowered due to the system's compact and automated design especially when compared to RBs or multi-layered cultureware. The high nutrition and aeration exchange levels of the Tide Motion principle reduces culture media consumption. TideXcell™ is a fully enclosed system and compressed air path comes with a double HEPA and VOC (volatile organic chemicals) filters. These filters remove particulates to maintain an ISO Class 5 environment during cell culture eliminating contamination risks. The system also comes with a germicidal UV-C decontamination suitable for BSL 3/4 applications.

Esco TideXcell™ concentrates cells within the matrix vessel, reducing total working volume to 1/5~1/25. This simplifies cell harvesting and downstream recovery processes, thereby reducing overall downstream processing cost. Columns are the most expensive component of any downstream process whilst concurrently maintaining high cell recovery. Matrix cassettes packed inside the matrix vessel, with its concentric cylindrical design even in 100 L, can be separated from the mixing vessel in a closed manner and placed in a freezer for direct freezing and thawing, making cell harvesting simpler and more efficient.

## Linearly Scalable Quality

(batch-to-batch consistency is uniform for cell seeding density/viral titer)

TideXcell™ is a truly linearly scalable system from laboratory scale to production scale. It employs the same culture principle from seed preparation using the CelCradle™ System to succeeding larger TideXcell™ System of up to 100 L packed-bed volume. It also features the TideXcell™ Harvesting System, which facilitates in the automated and closed system cell harvesting and seed transfer from one TideXcell™ System to another. True linear scalability allows faster and easier technology transfer with minimal bioprocessing time.



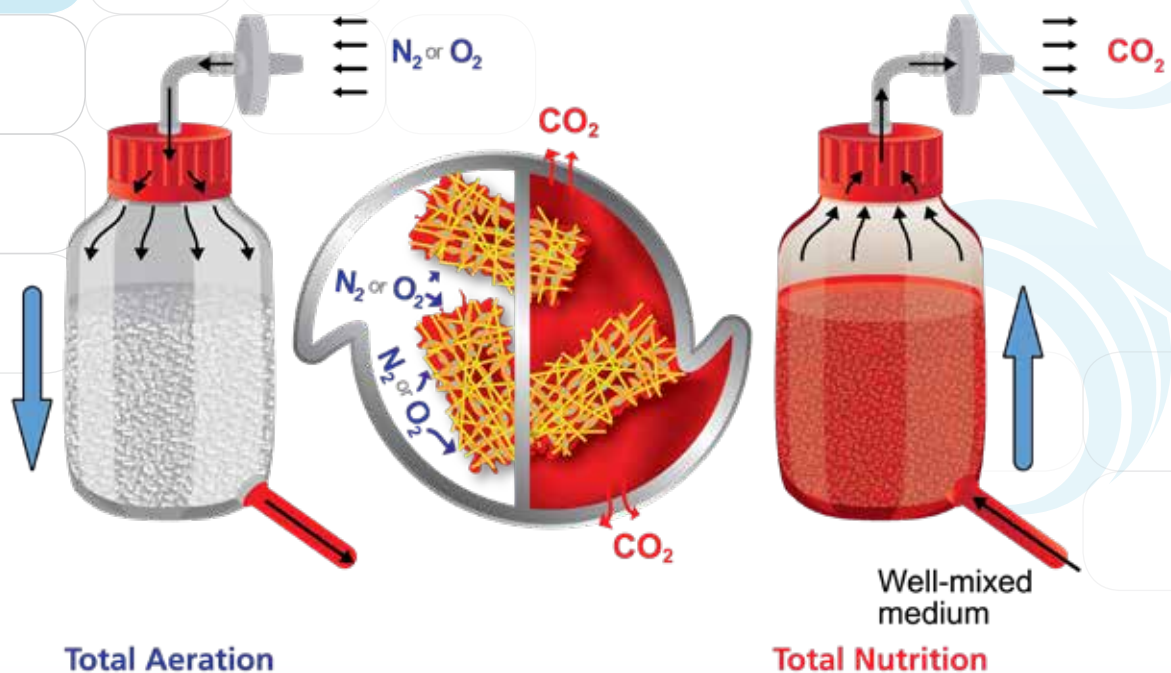
## Tide Motion Technology

### The Main Principle

Tide Motion is comparable to the cyclical low and high rise of the bodies of water on earth or like an artificial lung.. Similar to cell culture, patented Tide Motion principle is the gentle up and down of culture media in the reactor vessel. This oscillation principle provides nutrients and oxygen to cell being cultured, replacing the conventional stirred tank principle.

VacciXcell adherent bioreactor uses the proprietary BioNOC™ II macrocarriers that serves as a packed bed where cells can adhere to. These carriers mimic a 3D *in vivo*-like culture environment allowing cell to cell contact and a large surface area ratio for culturing cells. Together with the Tide Motion principle, BioNOC™ II macrocarriers are alternately exposed to air and nutrition.

### Highest Aeration (oxygenation) in Hypoxic or Normoxia Mode



## TideXcell™ Customer Reference

The following table shows cGMP-compliant customers using TideXcell™ in their projects. Company identities and some other information are hidden due to non-disclosure agreement (NDA), between the company and Esco Vaccixcell.

SECRETED VIRUS						
Country	Cell Line	Virus Strain	Cell Density (cells/mL)	Viral Titer	cGMP	SCADA/DCS
Taiwan	VERO	Japanese Encephalitis Virus	4.6x10 <sup>7</sup>	10 <sup>9</sup> pfu/ml	Yes	-
China	VERO	Rabies Virus	4.0x10 <sup>7</sup>	10 <sup>8</sup> IgLD <sub>50</sub> /ml	Yes	-
Taiwan	VERO	Enterovirus type 71	2.6x10 <sup>7</sup>	10 <sup>7.8</sup> TCID <sub>50</sub> /ml	Yes	-
Taiwan	MDCK	H5N1	2.3x10 <sup>7</sup>	HA=1024~2048	Yes	SCADA
Taiwan	MDCK	A(H1N1)	2.2x10 <sup>7</sup>	HA=512~1024	Yes	-
Taiwan	PK	Hog Cholera	3.7x10 <sup>7</sup>	10 <sup>6.5</sup> pfu/ml	Yes	-
China	ST	Hog Cholera	2x10 <sup>7</sup>	2mil. RID/ml	Yes	-
China	BHK-21	Rabies Virus	4.5x10 <sup>7</sup>	10 <sup>8.5</sup> TCID <sub>50</sub> /ml	Yes	-
Japan	MDBK	(NDA) Virus for Bovine Vaccine	1.29x10 <sup>7</sup>	10 <sup>9.2</sup> TCID <sub>50</sub> /ml	Yes	-
China	Marc145	PRRSV	1.16x10 <sup>7</sup>	10 <sup>8.29</sup> TCID <sub>50</sub> /ml	Yes	-
Spain	NDA	(NDA) Virus for Bovine Vaccine	2.6x10 <sup>7</sup>	N/A	Yes	-

NON-SECRETED VIRUS						
Country	Cell Line	Virus Strain	Cell Density (cells/mL)	Virus Titer	cGMP	SCADA/DCS
Japan	NDA	Hepatitis A	2x10 <sup>11</sup>	N/A	Yes	SCADA

## TideXcell™ Research References:

- Alan Yung-Chih Hu, "Purification of cell-based influenza H5N1 viruses by liquid chromatography technologies" in "Vaccine Technology IV", Eds, ECI Symposium Series, Volume P17 (2013). [http://dc.engconfintl.org/vaccine\\_iv/46](http://dc.engconfintl.org/vaccine_iv/46). (Link: [http://www.vaccixcell.com/downloads/pdf/Purification of cell-based influenza H5N1 viruses by liquid chrom.pdf](http://www.vaccixcell.com/downloads/pdf/Purification%20of%20cell-based%20influenza%20H5N1%20viruses%20by%20liquid%20chrom.pdf))
- Chang, K., Wang, Y., Lin, F., Liu, E., Hsieh, S., Weng, T., . . . Chong, P. (n.d.). A Novel Disposable Large Scale Cell Culture System for Influenza H5N1 Vaccine Development. (Link: [http://www.vaccixcell.com/downloads/pdf/TideCell H5N1 2008.pdf](http://www.vaccixcell.com/downloads/pdf/TideCell%20H5N1%202008.pdf))
- HO, L. (2008). Innovative Disposable Bioreactors for Membrane Protein Production Based on the Tide Principle. *BioProcessing Journal*, 16-24. Retrieved from [www.bioprocessingjournal.com](http://www.bioprocessingjournal.com). (Link: [http://www.vaccixcell.com/downloads/pdf/J71\\_Ho\\_144\\_032408.pdf](http://www.vaccixcell.com/downloads/pdf/J71_Ho_144_032408.pdf))
- Lin, W. A Novel Method for Making Pandemic Influenza Vaccines. (Link: [http://www.vaccixcell.com/downloads/pdf/Influenza Medigen Wenlii Lin.pdf](http://www.vaccixcell.com/downloads/pdf/Influenza%20Medigen%20Wenlii%20Lin.pdf))

Condenser bottle

HEPA Filter  
Inline UV lamp

Tide-In and  
Tide-Out Filter

UV lamp

Matrix Vessel

Scale



**ESCO**  
TideXcell™

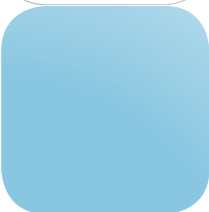
**TideXcell™ Incubation and Control System**

Compressed air path that comes with a double HEPA and volatile organic chemicals (VOC) filters to maintain ISO Class 5 environment during cell culture.

Optional Esco BioVap system can be added which guarantees 6-log bio-decontamination of the internal surface

**Matrix Vessel**

Houses BioNOC™ II (carriers) where cells adhere to



TideXcell™ 2L





**Pressure Gauge**

Used to measure and monitor the pressure from gases or liquids of the reactor in the system.



**TideXcell™ HMI/PLC**

User-friendly design and control system can be connected and configured to SCADA systems DeltaV and PCS7 controls. Dual redundant systems are also catered depending on the target requirement.



Power Indicator



Alarm Light



Emergency Stop Button

**Mixing Vessel**

Vessel for mixing pumped gases, acid, base, feed, and harvest among others

**Heating Coil**

Responsible for heating the culture medium to its optimum temperature during the process (temperature control).

**Mixer Scale**

Detects the weight of the mixing vessel and responsible for controlling Tide Motion exchange

**Acid Peristaltic Pump**

**Base Peristaltic Pump**

**Feed Peristaltic Pump**

**Harvest Peristaltic Pump**

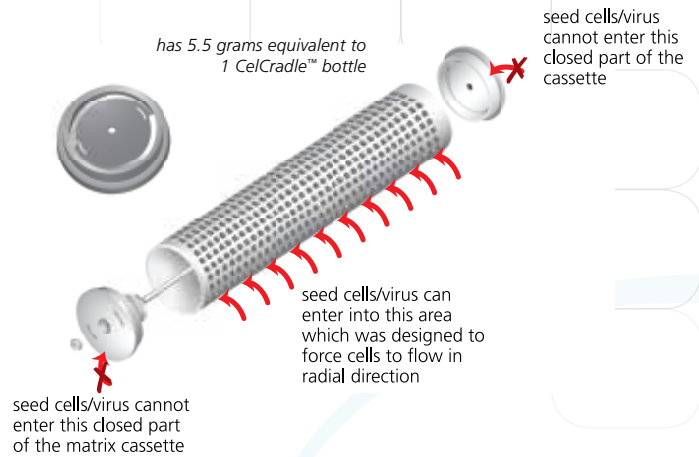
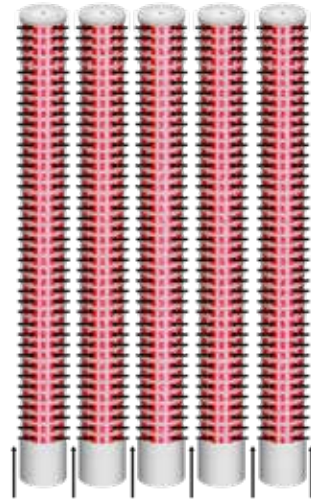
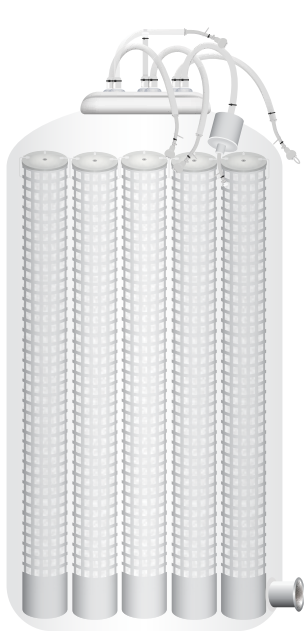
**Rotameters**

Manually controls the amount of air, nitrogen, oxygen, and carbon dioxide inside the incubator or in the mixing system. Optional upgrade for mass flow controllers are available.



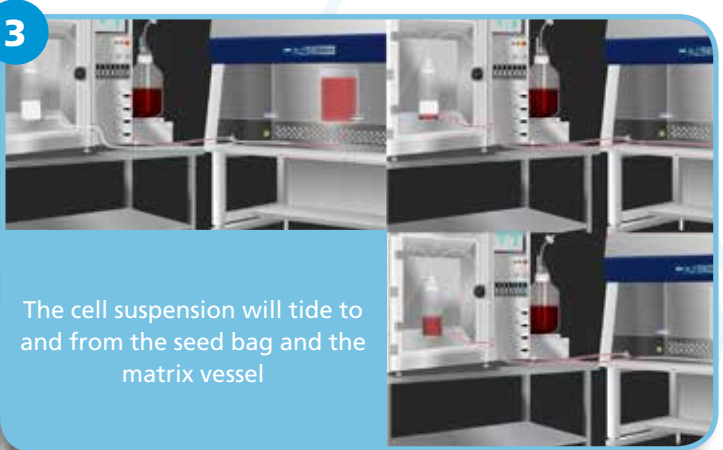
## Uniform Seeding Viral Infection/Transfection with Cartridge Matrix

TideXcell™ Matrix Bed is designed to cut the area into numerous small sections and force cells to flow in horizontal radial direction instead of vertical direction. The gradient effect during seeding phase could be minimized due to the forced flow of the seed cell/virus into the matrix cassette.



1

Viral seed or seed cells are prepared in a cGMP Grade B cell/viral processing room with installed CO2 incubators and Grade A biosafety cabinet (BSC) or a Grade A isolator incubator connected directly to TideXcell™ in Grade D background



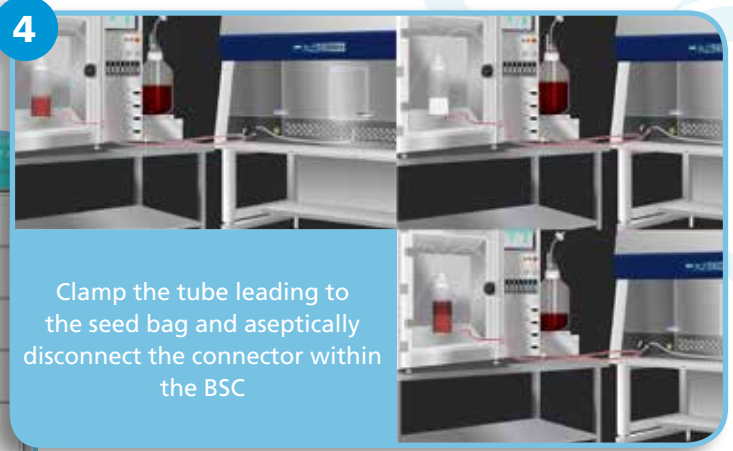
3

The cell suspension will tide to and from the seed bag and the matrix vessel



2

Input the parameters in the TideXcell™ system for the inoculation phase and run the program



4

Clamp the tube leading to the seed bag and aseptically disconnect the connector within the BSC

## Sampling

Closed system sampling can be done in the TideXcell™ system. Each vessel types have their own corresponding number of sampling port. For carrier sampling that are to be done more than the provided sampling port, Tide Motion should be stopped and the matrix vessel media level should be set at the lowest possible level. Sampling should be done inside a biological safety cabinet. Optional multi-sampling systems can be configured.

*Note: Make sure to clamp the tubing connection from the matrix vessel to the mixing vessel to avoid spillage.*

1



Pull out the string from the sampling port

2



Once the sampling tube had reached the end of the tubing, seal the tube with a sealer

3



Cut the part of the tubing an inch away from the sealed portion and place your retrieved sampling tube in a petri dish



Matrix Vessel-002  
1 SAMPLING PORT



Matrix Vessel-020  
2 SAMPLING PORTS



Matrix Vessel-100  
4 SAMPLING PORTS

## Culture Vessels

Different matrix vessels can be used in the same TideXcell™ Incubation and Control System. Furthermore, the working volume of the matrix vessel depends on the quantity of BioNOC™ II macrocarriers used. These two features provide users with a more flexible production. One of the best examples is the production of a conditioned media.

Culture medium compositions typically include essential amino acids, salts, vitamins, minerals, trace metals, sugars, lipids, and nucleosides. Conditioned media, on the other hand, contains many of the original components of the medium used, as well as a variety of cellular metabolites and secreted proteins, including, for example, biologically active growth factors and other extracellular proteins. This conditioned cell culture medium is typically used in culture manipulations such as for vaccine production and cosmetics.



### ▶ Single-use matrix vessel

- Vessel sizes available in 2 L, 20 L, and 100 L
- Gamma-irradiated, ready-to-use and are pre-packed with BioNOC™ II macrocarriers
- Features patent pending close sampling ports which consist of a basket immersed within the matrix vessel and connected to sampling port tube on the lid of the matrix vessel



### ▶ Reusable matrix vessel

- Autoclavable matrix vessel available in 2 L, 10 L and 20 L volumes
- Must be refilled with fresh and autoclaved BioNOC™ II macrocarriers to which a qualitative test for cells must be done.

Note: This is performed through direct sampling of carriers inside a Biological Safety Cabinet

TideXcell™ System	TideXcell™ System: 2-20L					TideXcell™ System: 100 L	
	2 L		10 L	20 L		100 L	
Matrix Vessel	Multiple-Use	Single-Use	Multiple-Use	Multiple-Use	Single-Use	Multiple-Use	Single-Use
Matrix Volume	1-2 L		5-10 L			50-100 L	
Closed Sampling Port No.	0	1	0	0	1-4	0	1-5
Pre-packed carrier (g)	0	55 110	0	0	275 550 1100	0	2,750 5,500
Material	Glass	PP	Glass	SS	PP	SS	PP
AutoFeeder	Integrated/AF-1200					AF-1200	

VacciCell provides a wide range of matrix vessels, depending on user's production density requirements.

# Mixing Systems

The TideXcell™ Mixing System is where the mixing vessel containing the culture medium is continuously mixed, and parameters such as pH, dissolved oxygen (DO), and temperature are monitored and regulated. Separating culture medium vessel and culture vessel dramatically decreases problems typically occurring during mixing. The separation of the matrix vessel and mixing vessel also permits temperatures to vary for cell and viral culture. Cells can be cultured to confluence at 37°C in 1 mixing vessel, after which 100% of a fresh medium at a lower temperature in a separate mixing vessel can be used for viral culture after virus seeding. This dual temperature control process can potentially produce higher virus titers for specific viral strains or aquaculture vaccines than what can be achieved in typical perfusion systems utilizing microcarriers or other packed bed bioreactors which are only able to culture at 1 set temperature.

All the mixing vessels have ports for pH probe, DO probe, temperature probe, harvest, and feed ports for direct emptying and filling of the vessels. Sampling ports are also available for medium sampling, and the additional ports can be used to pump in other reagents.

To offer more options, VacciXcell has adopted three (3) different types of mixing system:

- Magnetic stirrer mixing system,
- Recirculation thermostatic mixing system, and
- Stir tank mixing system.



The in-house magnetic stirrer mixing system uses a stainless steel magnetic stirrer for relatively small-scale mixing. Glass mixing vessel of up to 20 L is placed on the stainless steel magnetic stirrer. The stirrer speed can be set from 100 to 1,500 rpm. The temperature is controlled by a heating jacket which has a maximum temperature of 45°C.

*\*Single-use mixing system available at additional cost*

### **Magnetic Stirrer Mixing System**

10 L | 20 L

Vessel Material: Borosilicate Glass

System Material: Stainless Steel 304

*Single-use orbital mixer (ideal for HPL media for stem cells that need low agitation)*



TideXcell™-002



This multiple-use stainless steel mixing system is similar to stirred tank bioreactor for pilot or production scale. The culture medium is continuously agitated by an impeller and parameters such as dissolved oxygen, temperature, and pH are monitored and regulated. The tank consists of 2 impellers which is located on the bottom and at the center of mixing tank allowing media homogenization.

More than ten (10) types of impellers are available. Agitation rate, in general, ranges from 80 to 1000 rpm and temperature control up to 60°C

The Stirred Tank Mixing System has a built-in automated Sterilization-In-Place (SIP) system, allowing proper sterilization of the mixing tank and the culture medium. SIP (sterilization in place) protocol is consists of 5 steps:

- Heating 1
- Sterilization
- Cooling 2
- Heating 2
- Cooling 1

Protocols can be set and automatically runs according to the set value. Other features of this system include motorized tank lid lifter, which enables viewing the internal tank vessel, optional Wash-In-Place (WIP), glass window, and LED light which allows culture observation.



#### **Stirred Tank Mixing System**

30 L | 50 L | 100 L | 200 L | 500 L | 1000 L

Vessel Material: Stainless Steel 316 and Stainless Steel 304

System Material: Stainless Steel 316



TideXcell™-020



TideXcell™-100

Recirculation thermostatic mixing system is designed for relatively larger scale production. This system consists of a rectangular stainless steel which holds a disposable mixing bag.

#### Its key features include:

- Thermostatic panel on each vessel side wall
- Heating of 100-500 L media takes less than 4 hours
- Magnet-driven impeller enabling mixing without housing contact and bearing
- Single-use magnetic pump head mounted to the motor
- 0-21 LPM pump rate
- 0-50°C temperature range
- Autoclavable probe holders (located on the side wall)
- Side door ease for bag removal

#### **Recirculation Thermostatic Mixing System**

50 L | 100 L | 200 L | 500 L | 1000 L

Vessel Material: Plastic

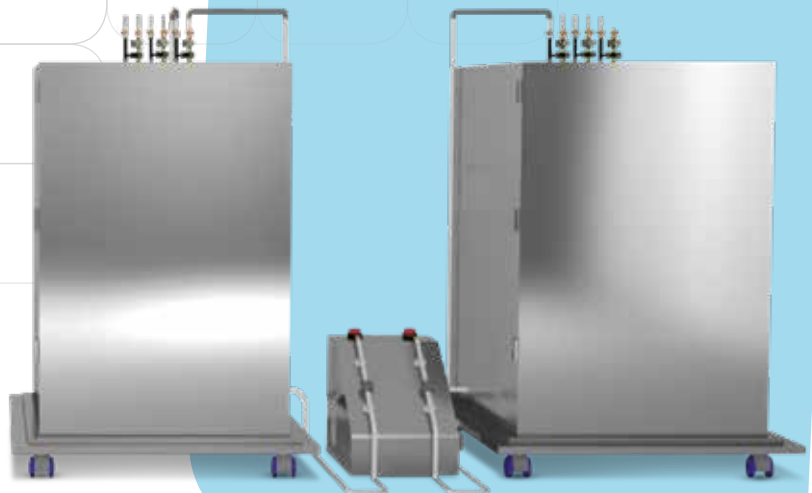
System Material: Stainless Steel 304



## Accessories

### Feed/Harvest System Triple Feed/Waste System

The Feed/Harvest system is used for batch, perfusion, and 100% media exchange processes. Waste culture media can be harvested on nth day and will pump in fresh culture media from the feed tank. 100% media exchange ensures high product cell yield and high viral titers at the end of the cell culture production. The system also allows harvest of 100% conditioned media from stem cell culture; harvesting from the mixer to the harvest tank and fed with 100% culture medium afterwards.



### AutoSwitch System

The AutoSwitch System is recommended when tanks will be used for feeding or harvesting. This system will be connected in between the tanks and will automatically switch to the other tank once empty (feeding) or filled (harvesting). Individual alarm lights are integrated in the system for tank depletion indication. In addition to this, the autoswitch system includes an inlet and non-invasive bubble detector.







## TideXcell™ Harvesting System

TideXcell™ Harvesting System (TXLHS) is specially designed for TideXcell™ high cell density culture system for cell recovery from the cultured matrix vessel.

- 1. Installation:** Mount and fix the TideXcell™ Matrix Vessel in the TideXcell™ Harvesting System and connect the TideXcell™ matrix vessel with tubing manifolds that will serve as path for introducing phosphate buffer saline (PBS), enzyme (usually TrypLE Select, Accumax, and Collagenase among others), enzyme inhibitor (when using serum-free culture medium), culture medium, and waste container. These six tubings connect with the Matrix Vessel through a manifold.
- 2. Rinse:** Rinse the matrices with phosphate buffer saline or equivalent solution to remove serum that could inhibit the enzymatic activity in the following step.
- 3. Enzymatic treatment:** Submerge the matrices with a chosen enzyme to digest cells until the cells round up for detachment.
- 4. Cell Detachment:** Shake the matrix vessel together with the matrices to shake off cells out of the porous matrixes.
- 5. Collection:** Collect the cells by washing the matrices with cell culture medium or equivalent solution and collect the cells into harvest tank.



### TXLHS

Various optional material handling can be used to allow ergonomic movement of 20 L matrix vessel from TXL to TXLHS.

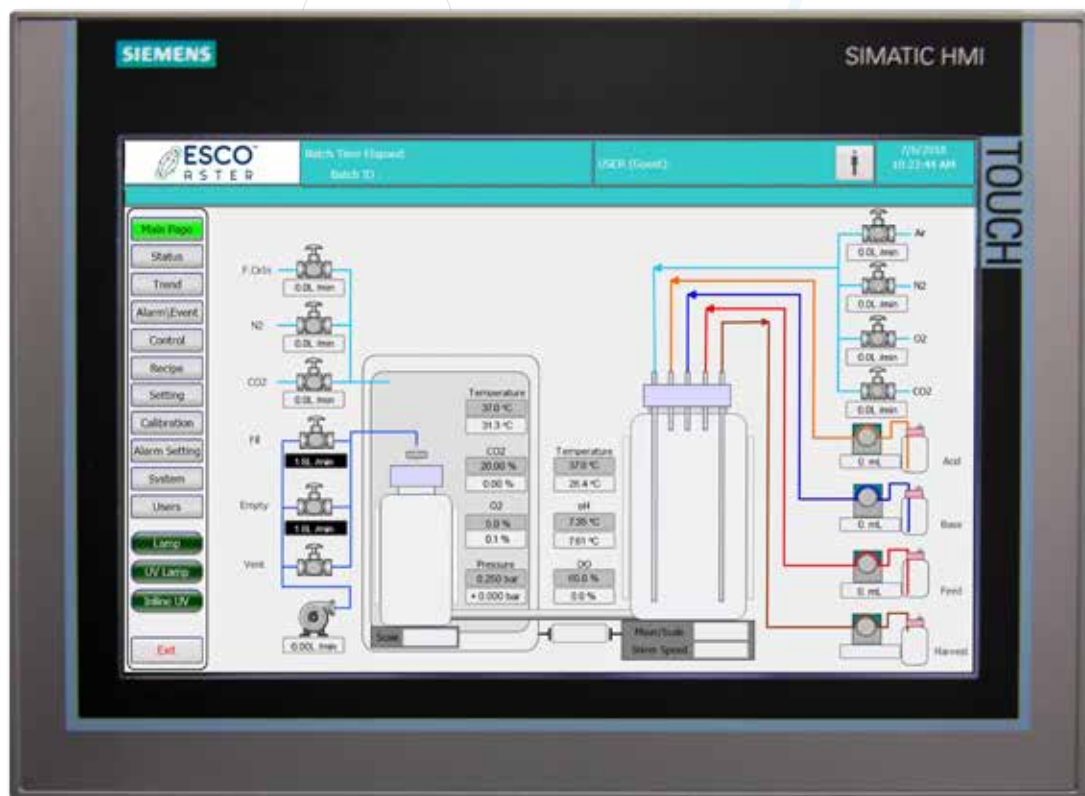
# PLC-based Monitoring and Control Structure

## Local Control

TideXcell™ is controlled by Siemens HMI/ PLC-based monitoring and control structure. This control structure ensures a fast, flexible, and reliable solution for continuous processing. PLC-based monitoring and control system can be connected and configured to SCADA systems that are using DeltaV and Pcs7 controls. Dual redundant systems for critical components such as PLC and pumps are catered for at additional costing.

### Its features include:

- Real-time vessel display
- Alarm monitoring
- Trend display
- Advanced DO control
- Gas flow control
- Perfusion control
- Sensor calibration
- Controller status indication



# The Wonder System

## SCADA

TideXcell™ PLC-based monitoring and control structure runs on WonderWare SCADA. This provides a high-level process supervisory management and data acquisition. This software platform will ensure process control safety, will support control strategy, and will provide a remote method of capturing data and events (alarms) for monitoring the continuous process. SCADA platforms also provide functions for graphical displays, alarms, trends and historical storage of data.

TideXcell™ is the core of Esco Aster, a contract development manufacturing organization (CDMO) that uses single-use adherent bioreactors in bioprocessing needs. Esco Aster focuses on process development, commercialization of new translational drugs (NTDs) for both humans and animals, orphan drugs, as a CMO for partner TideXcell™ factories looking to gain access in the ASEAN, ANZ, African region.



# TideXcell™ Product Specification

## TideXcell™ Incubation and Control Unit

Construction	External Carcass: 304 stainless steel	
Dimension	125 (W) X 70 (D) X 115 (H) cm	
Weight	240 kg	
Electrical requirements	AC 220V 20A, 50/60 Hz, Single phase UPS (uninterrupted power supply) with 6kVA/ 4.2kW should be prepared by customers	
Control Hardware (2-20 L)	Flexible pc-base/DAQ industrial control interface; Solenoid valves/PID gauges/Pressure-vacuum motor NDIR CO <sub>2</sub> diffusion-type sensor	
Control Hardware (50-100 L)	Siemens HMI/PLC based control structure Solenoid valves/PID gauges/Pressure-vacuum motor NDIR CO <sub>2</sub> diffusion type sensor	
Control Software	Siemens PLC-based control and monitoring structure Siemens HMI with 12.1" touchscreen Developmental environment: TIA Portal V13 SP1	
Incubator	0 – 20% CO <sub>2</sub> PID Control +8°C~27°C Operating Temperature Front view window; LED inside lighting Emergency power-off button	
Connection	CPC nickel-coated brass quick connectors Electric connectors with locking-screw	
Communication	9-pin Dsub RS-485 port : Modbus RTU protocol 2 USB Ports for import firmware / software upgrade and export trend data	
Control Features	Simple user's administration Process page & Date viewer page Data logging/ Parameters logging/ Events logging Individual seed and amp Cultivation conditions setting with default values Automatic switch from seeding stage to cultivation stage up to 300 minutes Automatic air refreshing mechanism	
	Tidal control	800 ~ 1, 800 mL/min
	Gas flow rate	0.8 – 20 LPM (depends on system size)
	Alkaline addition	80 mL/min at 100 rpm
	Perfusion rate	80 mL/min at 100 rpm
	File export	Excel (.xlsx)
	pH control	4~10 ±0.1
	DO control	0%~100% ±5%
	CO <sub>2</sub> control	0%~10% ±0.3%
Protection	Over pressure protection (max. 1 bar) Liquid leaking protection Over suction protection Over time protection	

## TideXcell™ Mixing System

	Magnetic Stirrer Mixing System	Recirculation Thermostatic Mixing System	Stir-tank mixing system
Construction	Magnetic stirrer 10 L, 20 L borosilicate glass vessel with stir bar for mixing	Recirculation Mixing with magnetic driven bearing-less impeller	Stir mixing with pre-installed impeller
Electrical Requirements	Monophase 3-threads AC 220V ±10V 5A max 50/60 Hz	Single phase, AC 220V, 9A max , 50/60 Hz	Three phase, 230 VAC, 50/60 Hz
Capacity	10 L and 20 L	50 L, 100 L 200 L, 500 L, 1,000 L	30 L, 50 L, 100 L, 200 L, 500 L, 1,000 L
Control	100 – 1,500 rpm stir rate RT to +45°C temperature control	Pumping rate 0 – 21 LPM RT to +50°C temperature control	80 – 1,000 rpm stir rate RT to +60°C temperature control SIP system (sterilization in place)

## Feed Tanks AutoSwitch System

Electrical requirements	Magnetic stirrer 10 L, 20 L glass vessel with stir bar for mixing
Control unit	Monophase 3-threads AC 220V ±10V 5A max 50/60 Hz
Features	Control two feed tanks by switching the feed line from one to another once the other tank is empty during feeding. Alarm light will turn on once the liquid in one of the tanks is depleted Alarm buzz will turn on when two feed tanks are empty
Sensors	In-line and non-invasive bubble detector x 2
Protection	Individual warning lights for indicating depletion of feed tanks

## TideXcell™ Harvesting System

Electrical requirements	AC with circuit breaker, single phase 220V, 50/60Hz, 30A, 3.5kW (at 300rpm)
UPS	10kVA, 220V on line. Any power outage event in short time may cause damage to the system as well as loss of data.
Control unit	Reliable Industrial PLC
Liquid transfer	Pumps, transfer buffer, enzyme, enzyme inhibitor, culture medium, harvest cell solution and waste for cell harvest purpose
Control parameters	Sequential control on each pump On/Off Pump time 0-999 secs Pump rpm : 20 – 250 rpm Shaking speed : 50 – 300 rpm Rotation : continuous, ½ turn Manual and automatic control
Features	Equipped with 6 peristaltic pumps for reagent input and output Compatible with 2 L and 20 L single use matrix vessels
Communication	CF card, RS485 data transfer
Protection	Door open protection Low speed alarm Abnormal alarm

# TideXcell™ Product Specification

Item Code		
2231012	TCICS-002	TideXcell™-002 Pro Incubation and Control system + Mixer + Three gas controller. Not necessary feed/harvest scale in case of perfusion system (Control System: Siemens HMI/PLC)
<b>Consumables</b>		
1400027	2 L Single Use Matrix vessel for TideXcell™-002 include 110g BioNOC™ II carrier, 1x sampling port	Single-use, gamma irradiated
1400066	TideXcell™ Matrix Vessel 2 L, Autoclavable	Multiple-use, need to change connection tubes
1400028	TideXcell™-002 Mixing Vessel, 10 L	Multiple-use, need to change connection tubes themselves
1400029	TideXcell™ Acid/Alkali Bottle 1 L	Multiple-use, need to change connection tubes
1400030	TideXcell™ Seeding Bottle 2 L	Multiple-use, need to change connection tubes
NA (RCBB2006)	50L Bioprocess Container (MOQ=10) for continuous culture	Single-use, alternative for feed/harvest tank (1400031)
1400031	TideXcell™ FEED/HARVEST Tank 50 L (2 pcs)	Multiple-use (need caution when autoclaving)
1400032	TideXcell™-002 Tool Box	Recommended to purchase initially to ensure that all miscellaneous parts are complete and prepared for support. Tubings, luer locks, plugs, etc can be purchased locally.
1400235	TideXcell™-002 Accessories	

Item Code		
2231013	TCICS-020	TideXcell™-020 Pro Incubation and Control System (TCICS-020) (Control System: Siemens HMI/PLC)
<b>Consumables</b>		
1400069	Disposable Bag Thermostatic Mixer-200 L	
1400045	20 L Single-Use Matrix Vessel for TideXcell™-020 include 1100g BioNOC™ II carrier, 4x sampling port	Single-use, gamma irradiated
1400077	20 L Autoclavable Matrix Vessel Empty	Multiple-use, need to change connection tubes
1400073	TideXcell™ 200L Mixing Bag with single use pump (MOQ 5pcs)	Single-use
1400060	TideXcell™ Acid/Alkali Bottle 10 L	Multiple-use, need to change connection tubes
1400062	TideXcell™ Seed Vessel 20 L	Multiple-use, need to change connection tubes
1400065	TideXcell™ -020 Tool Box	Recommended to purchase initially to ensure that all miscellaneous parts are complete and prepared for support. Tubings, luer locks, plugs, etc can be purchased locally.
1400235	TideXcell™-020 Accessories	

Item Code		
Item Code	Description	Single Use or Multiple Use
1400018	BioNOC™ II Cell Culture Carriers (50 g)	Can be autoclaved or gamma irradiated, but not recommended as residues of cells/viruses may remain
1400019	BioNOC™ II Cell Culture Carriers (250 g)	
1400020	BioNOC™ II Cell Culture Carriers (1,000 g)	

## TideXcell™ Dimension Comparison



TideXcell™ - 002



TCICS-002 Magnetic Stirrer Mixing System

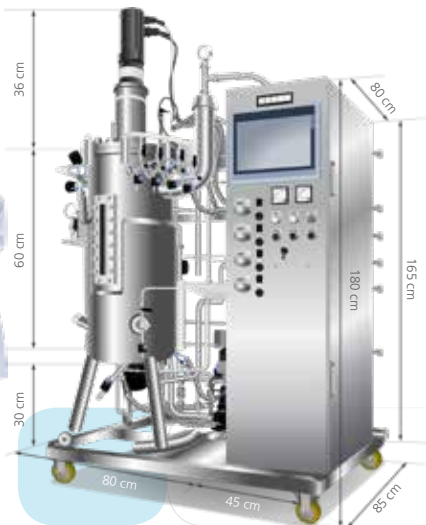
TideXcell™ - 020



TCICS-020 Recirculation Mixing System



TCICS-020 Stirred Tank Mixing System



TideXcell™ - 100



TCICS-100 Recirculation Mixing System



TCICS-100 Stirred Tank Mixing System



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