



BIOPROCESS PRODUCTS

Wuhan CEKG Technology Co., Ltd.



ENTERPRISE INTRODUCTION

Founded in 2016, Wuhan CEKG Technology CO., LTD. is a developer, manufacturer and marketer of high-tech medical equipment and consumables. With its core skills in cell culture technology, the company is committed to providing a range of high-quality products, e.g. traditional bioreactor, rocker bioreactor, single-use bioreactor, fabric carrier, single-use bags, single-use magnetic mixer, fabric carrier bag etc., as well as offering cell culture technology services.

The company has its own cell culture laboratory, which can provide cell culture technology services and bioreactor maintenance and certification services.

The company has successively applied for 33 patents, won the honorary title of high-tech enterprise and Wuhan science and technology "Little Giant" enterprise, and passed the ISO9001 quality system certification.

The company has its own main brand CEKG®, which focuses on providing cell culture equipment and consumables for vaccines, cell and gene therapy, antibodies and other industries. After the unremitting efforts of the team, the company has become an advanced high-tech enterprise in the industry.



QUALIFICATION HONOR



PATENTS





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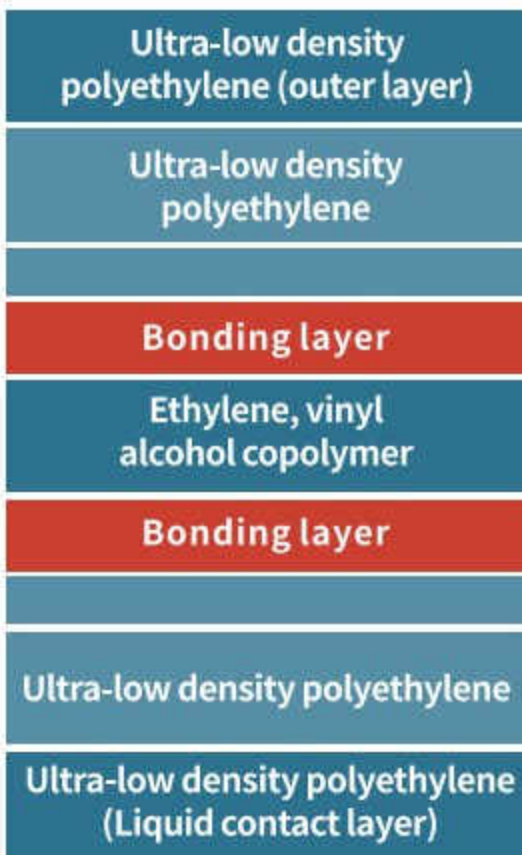
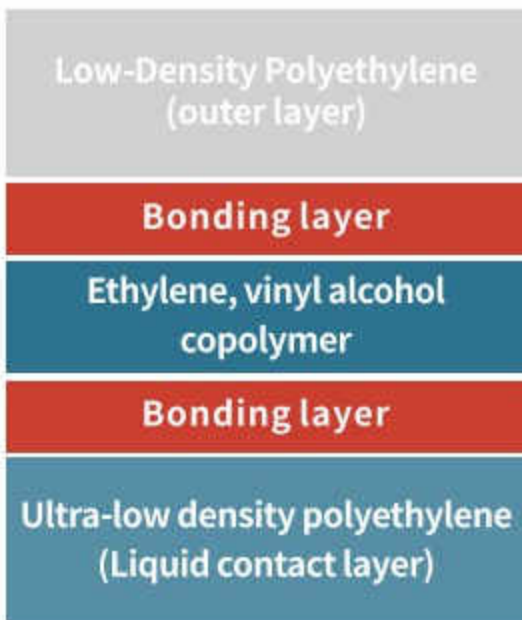
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SERVICES



PRODUCT INTRODUCTION



SINGLE-USE BAG PRODUCTS

FILM INTRODUCTION

All single-use bags of CCKG are made with Multi-layer PE co-extruded film

FEATURE

- 01 Thickness: 0.325mm
- 02 Good softness
- 03 Low precipitation/ dissolution
- 04 Good barrier property
- 05 Inner layer: ultra-low density polyethylene
- 06 ADCF
- 07 Sterilized by γ-ray irradiation (25-40KGy)

COMPATIBILITY

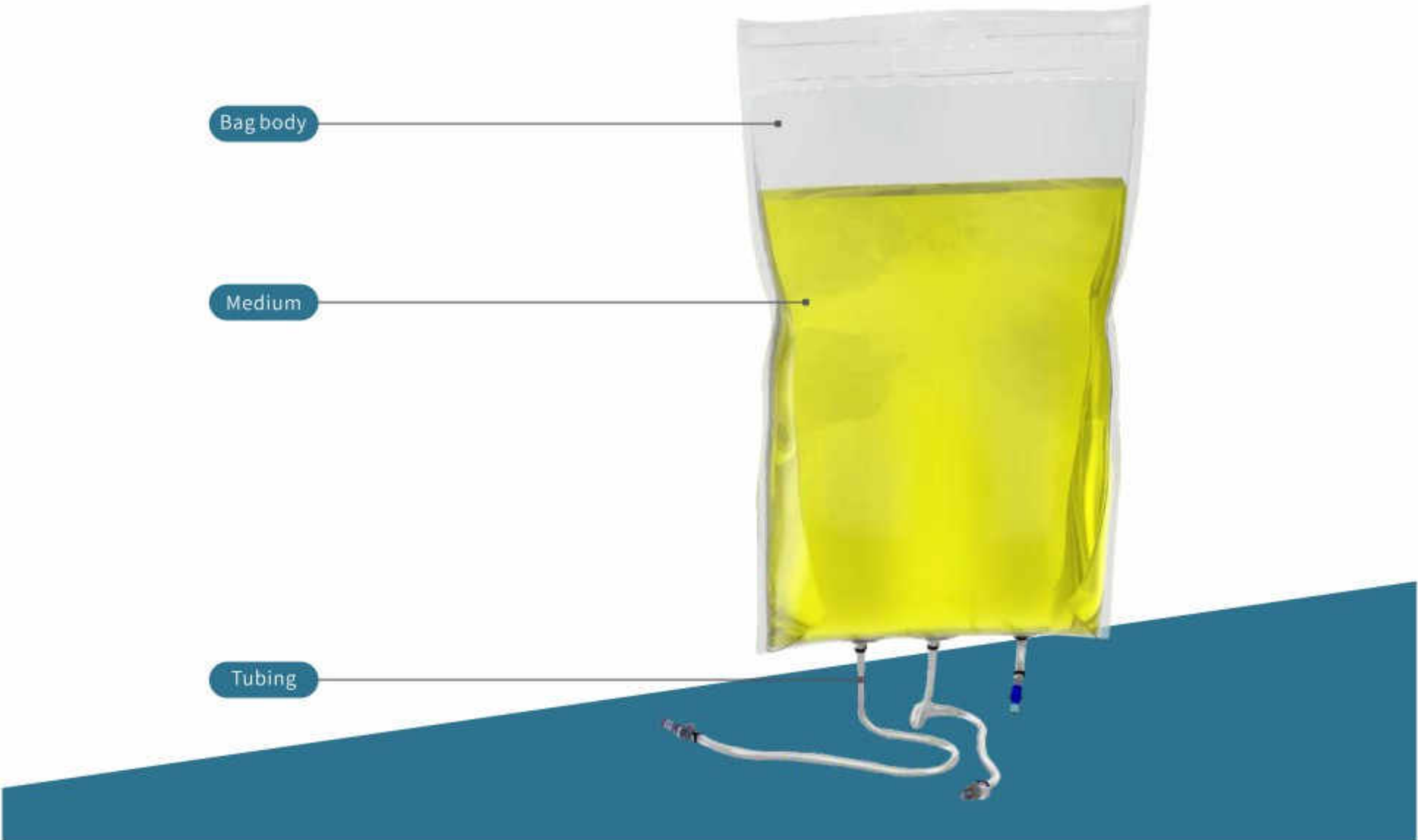
Items	Reference standards
Hemolysis test	ISO 10993-4
Cytotoxicity	ISO 10993-5
Implantation test	ISO 10993-6
Irritation and Sensitization test	ISO 10993-10
Acute systemic toxicity test	ISO 10993-11
Bacterial endotoxins-LAL test	USP<85>
Biological reactivity testing, in vivo, class VI	USP<88>
Plastic container European Pharmacopoeia test CH. 3.1.5	USP<661>

CHARACTERISTICS

Name	Test Value (pre-irradiation/ post-irradiation)	Reference Standards
Haze	7/7%	ASTM D-1003
Transparency	97/97%	ASTM D-1003
Light transmittance	93/93%	ASTM D-1003
Tensile strength	14/13MPa	ASTM D-882
Elongation at break	280/300%	ASTM D-882
Elasticity coefficient	370/350%	ASTM D-882
The lowest tolerable temperature	-45/-45°C	ISO8570
Density	0.9g	ASTM D-792
Water vapor permeability	0.35/0.32 (g/ (m ² .day)) (23°C,100%RH)	ASTM F-1249
Oxygen permeability	<0.05/<0.05 (cm ³ / (m ²)) (23°C,0%RH)	ASTM D-3985
Carbon dioxide permeability	<0.2/<0.2 (cm ³ / (m ²)) (23°C,0%RH)	ASTM D-2476



SINGLE-USE 2D BAG



FEATURE

- 01 Good stability
- 02 Good compatibility

- 03 Application for storage and transfer
- 04 Customization for configuration

ADVANTAGE

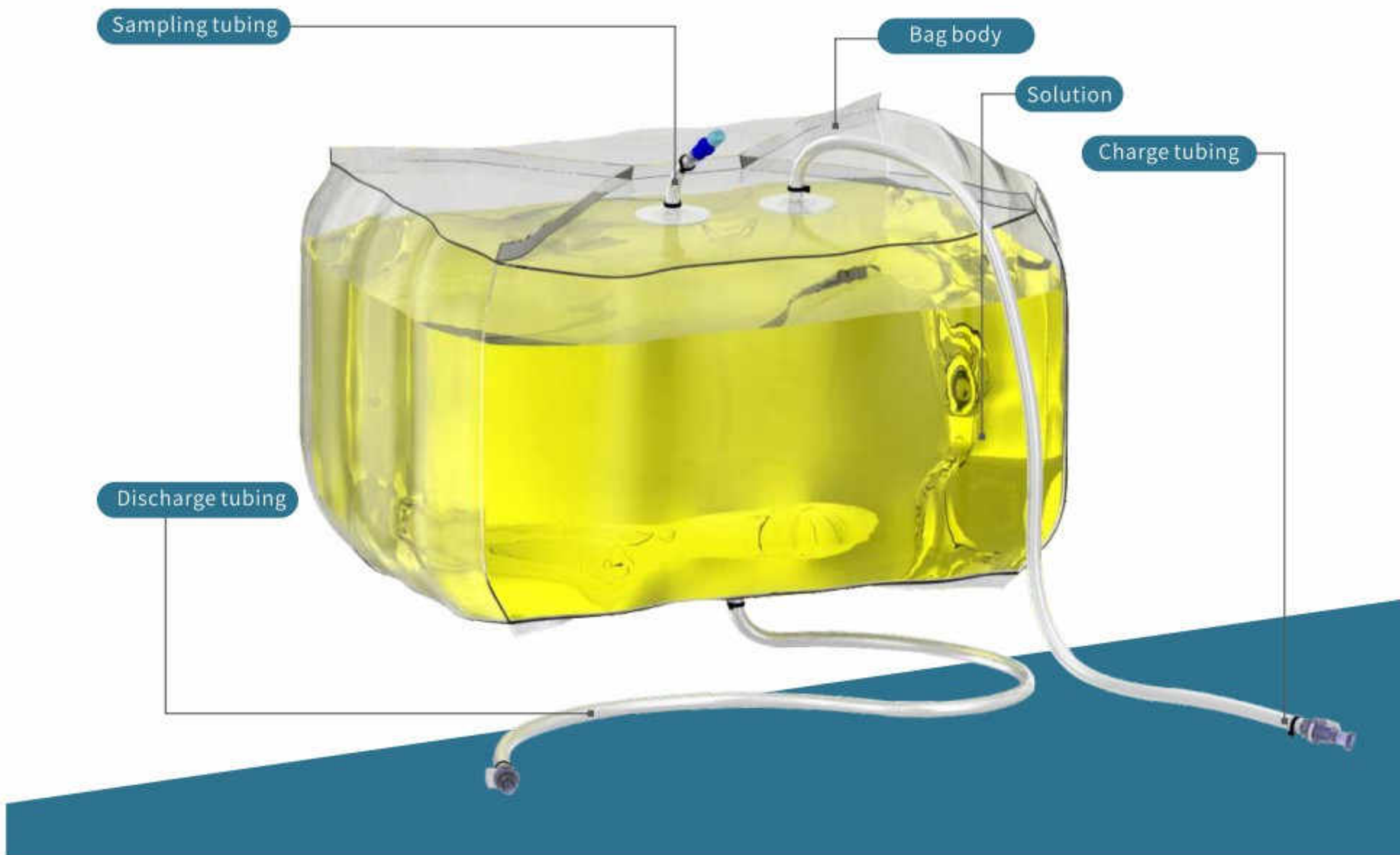
PRODUCING IN IS07/IS05 **Q1** **LEAKAGE TEST** **Q2**
 Production in IS07/IS05 100% leakage test

FREEZED **Q3** **CUSTOMIZED** **Q4**
 Freezed Customized

APPLICATION

- 01 Storage and transfer of medium
- 02 Storage and transfer of buffer
- 03 Collection and storage of samples and compositions
- 04 Storage of intermediate products and semi-products

SINGLE-USE 3D BAG



FEATURE

- 01 Good stability
- 02 Good compatibility

- 03 Application for storage and transfer
- 04 Customization for configuration

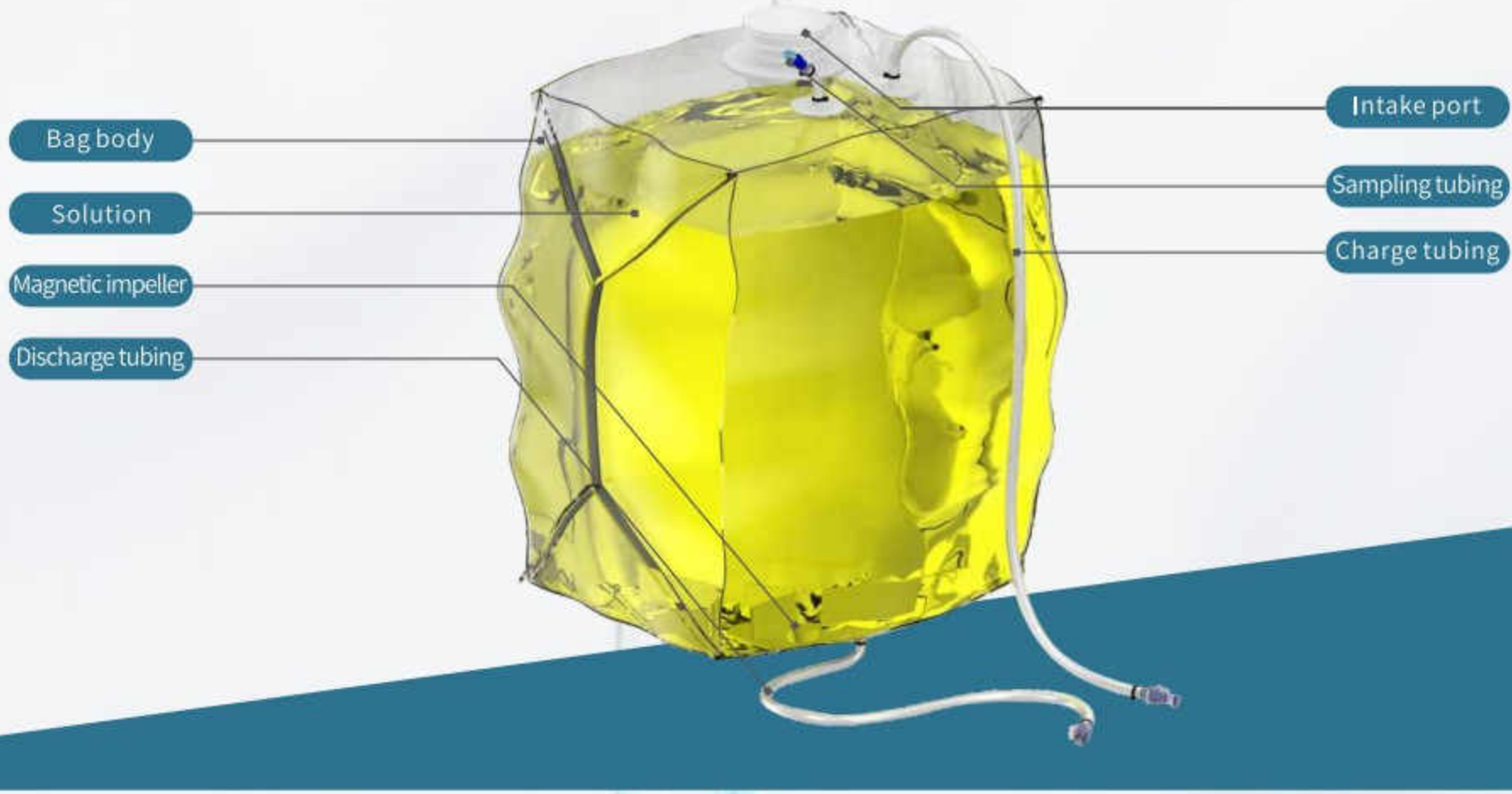
ADVANTAGE

- PRODUCING IN IS07/IS05** 01
Production in IS07/IS05
- LEAKAGE TEST** 02
100% leakage test
- FREEZED** 03
Frozen
- CUSTOMIZED** 04
Customized

APPLICATION

- 01 Storage and transfer of medium
- 02 Storage and transfer of buffer
- 03 Collection and storage of samples and compositions
- 04 Storage of intermediate products and semi-products

SINGLE-USE MAGNETIC MIXING BAG



FEATURE

- 01 Good stability
- 02 Good compatibility
- 03 Application for preparation and transfer
- 04 Customization for configuration

APPLICATION

- 01 Medium preparation
- 02 Buffer preparation
- 03 pH adjustment
- 04 Intermediate products and semi-products preparation

ADVANTAGE

- 01 **PRODUCING IN IS07/IS05**
Production in IS07/IS05
- 02 **LEAKAGE TEST**
100% leakage test
- 03 **FREEZED**
Freezed
- 04 **CUSTOMIZED**
Customized

- 05 Intermediate products mixing
- 06 Intermediate products inactivation
- 07 Semi-products preparation

SINGLE-USE SAMPLING BAG



FEATURE

- 01 | Good chemical compatibility and biocompatibility
- 02 | 3 ports and 2 ports optional, and easy for configuration to suit sampling process
- 03 | Customized to 5 sampling bag kits/10 sampling bag kits
- 04 | Assembling with 2D bags/3D bags/mixing bags/ cell culture bags

APPLICATION

- 01 | Sampling in various Processes

ADVANTAGE

PRODUCING IN
IS07/IS05

01

LEAKAGE TEST

02

Production in IS07/IS05

100% leakage test

FREEZED

03

CUSTOMIZED

04

Freezed

Customized

CONSUMABLES

CPC Connectors

Different connectors including quick connectors, aseptic connectors, aseptic dis-connectors and SIP connectors.

01 **CPC quick connectors**
 Quick connectors including MPC.MPX, MPU and sanitary connectors; sanitary connectors can be connected to sanitary clamps with integrated into single-use or stainless steel process system



02 **CPC aseptic connectors**
 CPC aseptic connectors can be applied into no-clean area and various types optional.



03 **CPC aseptic dis-connectors**
 CPC aseptic dis-connectors can avoid contamination and various types optional



04 **CPC SIP connectors**
 CPC SIP connectors are applied under SIP, and various types optional



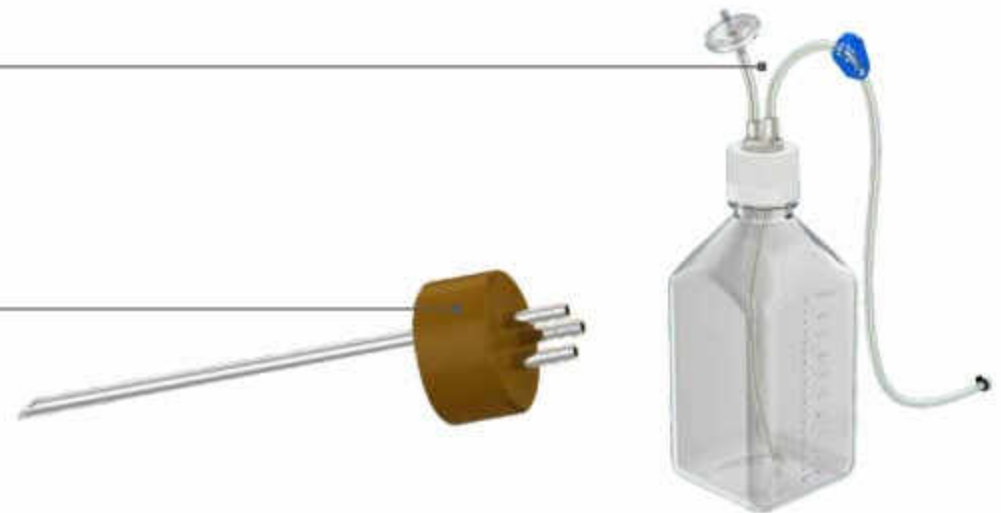
SINGLE-USE ADDITION BOTTLES/3 PORTS BOTTLE CAP

Single-use addition bottle

Pre-sterilized single-use bottle kit for ready to use
C-flex tubing can be connected to cell culture bags

3 ports bottle cap

3 ports bottle caps match with glass bottles



SILICONE TUBING/C-FLEX TUBING

SILICONE tubing/C-flex tubing
from domestic or abroad brands
for bio-pharmaceutical process



CONNECTORS AND TUBING CLAMPS

FEATURE

- 01 Including different sizes and types
- 02 Barbs specially designed for silicone, C-flex and other hoses, easy to install and uneasy to pull out
- 03 Durable and smooth inner surface
- 04 For piping connection/reducing conversion/branches or collection in bio-pharmaceuticals

Reducer



4 way connectors



T connectors



Y connectors



Thumb clamp



Y clips



CUSTOMIZED SERVICE

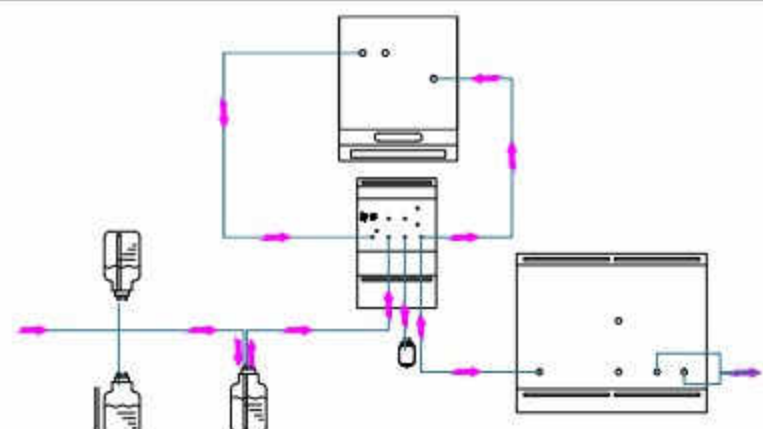


SERVICE DESCRIPTION

Provide customization of single-use cell culture bags/assembling/irradiation services according to the demands of customers. Accessories include hoses/quick connectors/aseptic connectors/SIP connectors/sampling bottles/filters etc.

FEATURE

- 01 Provide customization of single-use cell culture bags/process design
- 02 Production in ISO5/ISO7
- 03 Production line process to ensure quality
- 04 Fast and partial delivery

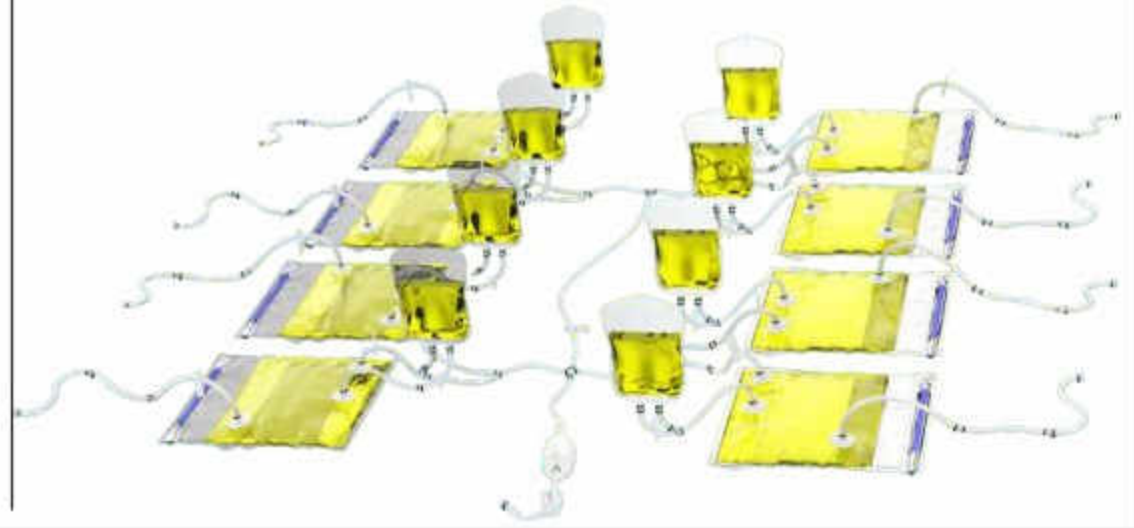
APPLICATION

<div style="border: 1px solid #ccc; border-radius: 10px; padding: 5px; display: inline-block; width: 30px; height: 30px; text-align: center; line-height: 30px; font-weight: bold; font-size: 18px;">01</div> <p style="margin-top: 10px;">Customization cell culture bags and assembly services Provide customization of single-use cell culture bags/process design</p>	
<div style="border: 1px solid #ccc; border-radius: 10px; padding: 5px; display: inline-block; width: 30px; height: 30px; text-align: center; line-height: 30px; font-weight: bold; font-size: 18px;">02</div> <p style="margin-top: 10px;">Customization filter and piping assembly Composed of one or more filters and piping and the kit sterilized</p>	
<div style="border: 1px solid #ccc; border-radius: 10px; padding: 5px; display: inline-block; width: 30px; height: 30px; text-align: center; line-height: 30px; font-weight: bold; font-size: 18px;">03</div> <p style="margin-top: 10px;">Customization bottle and piping assembly Composed of one or more bottles and piping and the kit sterilized</p>	

04

Customization bags and assembly

Composed of more sampling bags/
addition bags/batch bags and the
kit sterilized



05

Customization bottles and assembly

Composed of addition bottles/
harvest bottles/batch bottles
and the kit sterilized





SKC400 SINGLE-USE MAGNETIC MIXING SYSTEM

PRODUCT INTRODUCTION



APPLICATION

- 01 Medium mixing and prepared
- 02 Mixing for vaccine adjuvant
- 03 Mixing pH or conductivity of intermediate product in purification process
- 04 Ultra filtration and semi-finished product prepared
- 05 Dilution preparation of concentrated buffer

INTRODUCTION

SKC400 single-use magnetic mixing system adopts brand components from domestic and abroad. The equipment has a neat appearance, easy to clean and disinfect, concise human-machine interface, stable process control and convenient operation.

SKC400 single-use magnetic mixing system is a stable and high efficient system with stainless steel liquid container to meet requirements of liquid-liquid/solid-liquid mixing etc.

SKC400 single-use magnetic mixing system composed of master controller, universal magnetic drive unit, single-use bag with magnetic impeller, and a stainless steel container.

FEATURE

- 01 | Piping skid and container manufactured by SS 304
- 02 | The magnetic impeller in bag driven by coupling motor without seal
- 03 | Siemens PLC control, color LCD touch screen, control stability and easy to operate
- 04 | Modular design and configuration with temperature/load cell/pH/ DO/conductivity, etc.
- 05 | External needle printer can print the real data optional
- 06 | The single-use mixing bags are independently produced by ourselves with validation and stable long-term supply.
- 07 | 3 level security, audit trail, batch report, electronic signature, and GMP standards.

SPECIFICATION

Blade quantity	4/3 blades
Materials	PP
Maximum speed	300rpm
Location	Center or eccentricity



SPECIFICATION

Control System	Siemens color touch screen, Ethernet interface, USB interface, Human-machine interface, and save data
Agitator	Magnetic drive. Max. speed: 300rpm
Impeller*	Single-use magnetic impeller, impeller type optional. Impeller material is PP
Agitating bag*	Standard bags or customized according to container size and volume
Container Type *	Round and square
Load cell*	Optional
pH*	Optional
Conductivity*	Optional
Temperature*	Optional
DO	Optional
Jacket design*	Optional. for low-temperature mixing
Software design*	Optional. 3 level security, audit trail, batch report, electronic signature, and GMP standards
Needle printer*	Optional
Operating temperature	No more than 45°C

Note: *Optional

SPECIFICATION

Volume	50L	100L	200L	500L	1000L	2500L
Design	Discharge from bottom, sampling ports/addition ports and probe ports in the side					
Material	SS304					
Surface polished	Ra ≤ 0.6μm					
Trundle	Large castor and polyurethane material					
Installation	Side operation door					



PRODUCT INTRODUCTION

SKC400 SINGLE-USE MIXING SYSTEM



INTRODUCTION

It adopts brand components from domestic and abroad. The equipment has a neat appearance, easy to clean and disinfect, simple man-machine interface, and stable process control.

It is mixing system with advantages of portability/high mixing efficiency/convenient use/small footprint and convenient transportation.

Applied for liquid-liquid/solid-liquid mixing and meets the demands for small/medium scale mixing system.

FEATURE

- 01 | Piping skid and container manufactured by SS 304
- 02 | The upper stirring matched with the turbine stirring Impeller, and PTFE optional
- 03 | Siemens PLC control, color LCD touch screen, stability and easy to operate
- 04 | Emergency switch and 3 level security
- 05 | Platform scale optional
- 06 | Transfer base
- 07 | Volume 50L/100L/200L optional
- 08 | Standard bags and customization
- 09 | Container SS304 and HDPE optional

APPLICATION

- 01 | Mixing of medium and prepared
- 02 | Mixing of intermediate product in purification process
- 03 | Mixing of Ultra filtration process

SPECIFICATION

Control system	Servo mixing system, Siemens color touch screen, Ethernet interface, USB interface
Agitator	Upper mixing, Max. speed: 300rpm
Impeller*	Turbine agitator, blade material is PTFE
Agitating bag*	Standard bags or customization
Container type*	Round
Load cell*	Optional
Operating temperature	No more than 45°C

Note: * Optional

SPECIFICATION

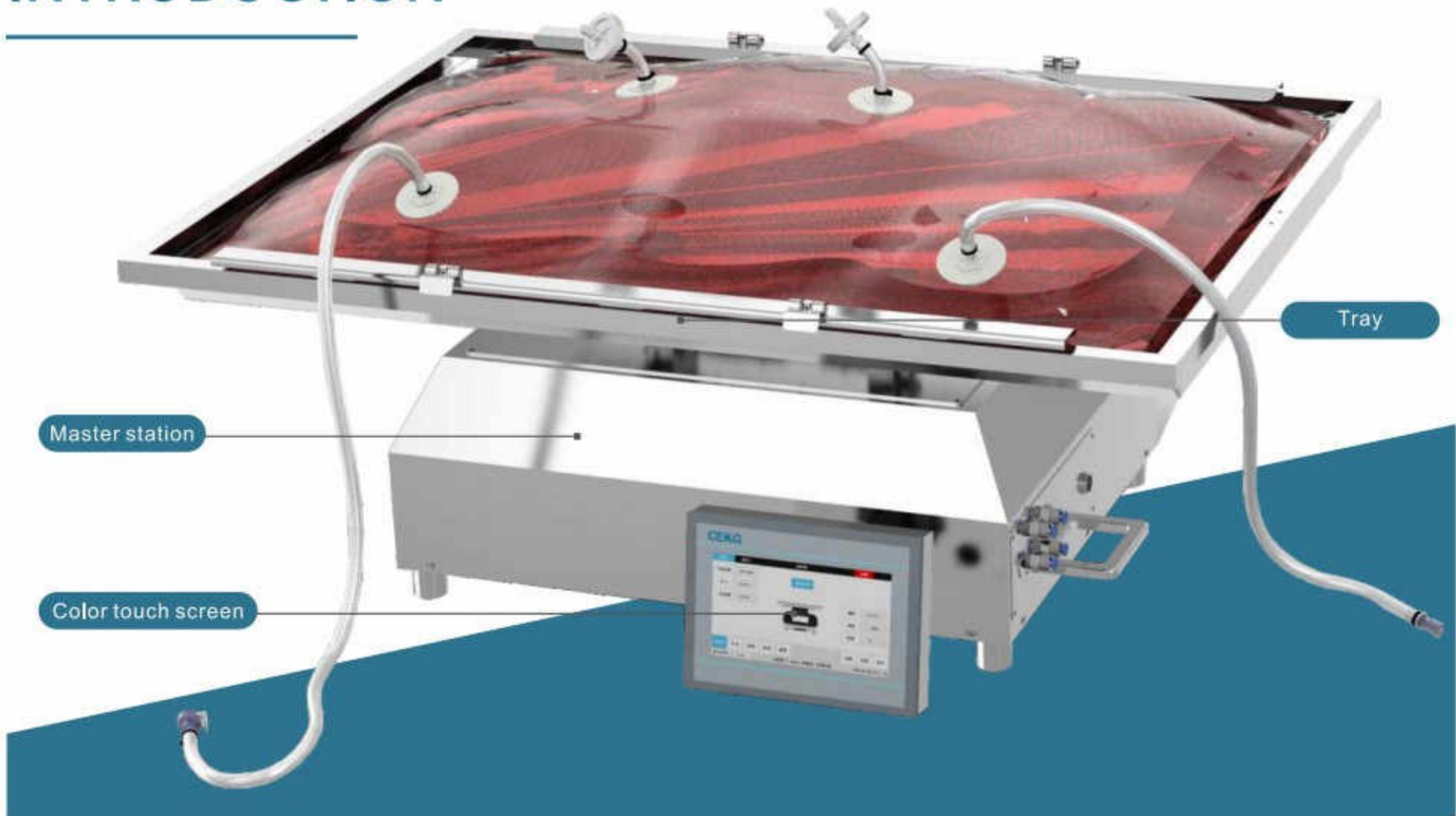
Volume	50L	100L	200L
Material	SS304		
Surface polish	Ra≤0.6μm		
Trundle	Large castor and polyurethane material		
Bag installation	Easy to take out and install		
Drain	Bottom or drain optional		

Note: * Optional



SKC400 ROCKER MIXER

PRODUCT INTRODUCTION



INTRODUCTION

The rocker mixer adopts non-intrusive wave mixing, which avoids the shearing force damage to the mixture by the end of the stirring blade. Compared with the stirring type mixer, it can provide a mild and low-shear mixing condition.

For cells/viruses/plasmids and decomposable medium, our company has developed a low temperature(5°C or below) rocker mixer and meet the requirements of low shear force with high mixing efficiency.

FEATURE

- 01 | Low-shear mixing condition
- 02 | No other stirring blades, saving transfer time and cost
- 03 | Standardized operation process and easy to verify
- 04 | Customized for trays and bags optional
- 05 | Modular design and configuration with temperature/load cell/pH/ DO/ conductivity, etc.

APPLICATION

- 01** | Plasmid mixing and plasmid lysis

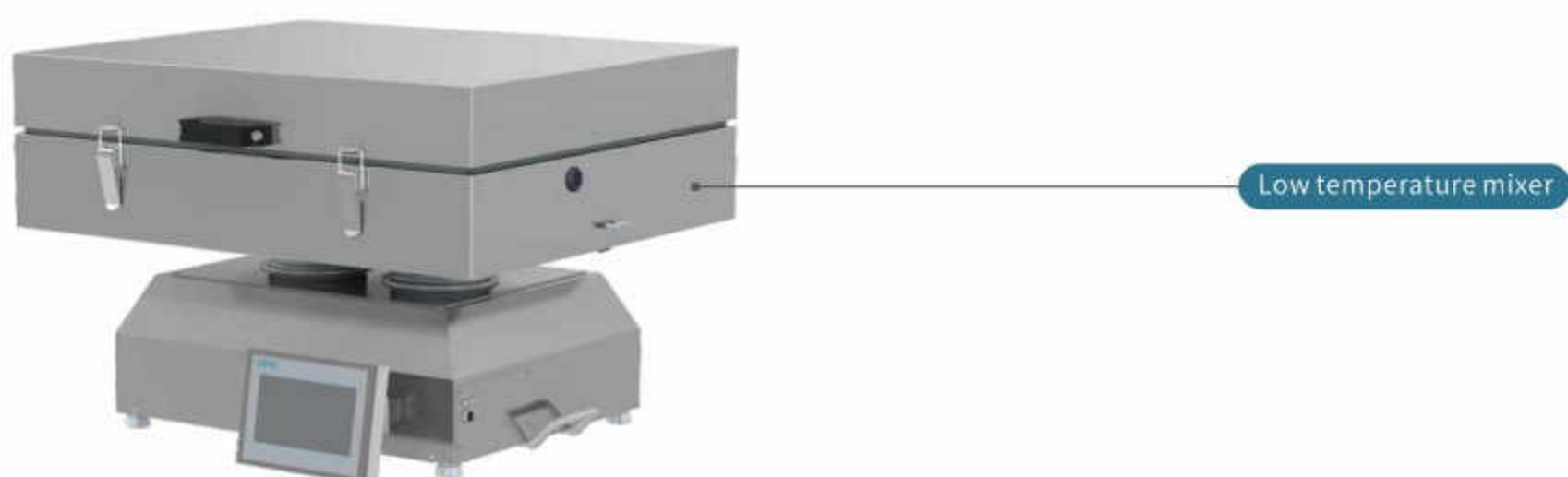
02 | Mix the virus liquid under low shear force and low temperature

03 | Dilution preparation of concentrated buffer

04 | Mixing pH or conductivity of intermediate product
- 05** | Part of ADC reaction container

06 | Preparation of semi-finished products

07 | Mixing in a low temperature condition or easy decomposed medium



SPECIFICATION

Tray size	10L	20L	50L	200L
Total Mixing bag volume	2L/5L/10L	10L/20L	20L/50L	100L/200L
Processing capacity	1L-5L	2-10L	5-25L	20-100L
Control system	Siemens color touch screen, Ethernet interface, USB interface			
Mixing system	Mixing time, rocker speed and rocker angle (if any) automatically stop after mixing.			
HMI	Alarm record interface/trend graph interface/calibration interface /time cascade interface, etc.			
Rocker speed	1-40rpm			1-25rpm
Lid ※	Optional			
Tilt angle※	Optional. Range: 1-12°			1-10°
Conductivity detection※	Optional			
pH detection※	Optional. Range: 5-9			
Temperature control※	Optional. PID automatic control, accuracy: $\pm 0.2^{\circ}\text{C}$; Temperature control range: 5-40°C max. 60°C			
Low temperature control※	Optional. Low temperature refrigerant to control the low temperature, PID control, 5 °C or below			
Pumps ※	Optional. 1-3 fixed-speed/variable-speed peristaltic pumps			
Load cell ※	Optional			
SCADA Software ※	Optional. 3 level security, audit trail, batch report, electronic signature, and GMP standards			
Power Supply	AC220V, 50/60Hz, 10A			AC220V, 50/60Hz, 16A

Note: ※ Optional



PRODUCT INTRODUCTION

SKC400 STORAGE SYSTEM



Load cell

Container

Operating Port

INTRODUCTION

SKC400 single-use storage system adopts brand components from domestic and abroad. The equipment has a neat appearance, easy to clean and disinfect, concise human-machine interface, stable process control and convenient operation.

SKC400 single-use storage system is a stable and high efficient system with stainless steel liquid container to meet requirements of low temperature storage.

SKC400 single-use storage system composed of master controller, single-use storage bags, and stainless steel containers.

Single-use storage bags are independently produced by ourselves with validation and stable long-term supply.

FEATURE

- 01 | Piping skid and container manufactured by SS 304
- 02 | Siemens PLC control, color LCD touch screen, stability and easy to operate
- 03 | Modular design and configuration with temperature/load cell/pH/DO/conductivity, etc.
- 04 | External needle printer can print the real data optional
- 05 | The single-use storage bags are independently produced by ourselves with validation and stable long-term supply
- 06 | 3 level security, audit trail, batch report, electronic signature, and GMP standards
- 07 | Customized design, 2/3 layer stacking, operating door, etc.
- 08 | Unnecessary of CIP and SIP

APPLICATION

- 01 | Medium storage
- 02 | Intermediate storage
- 03 | Buffer storage
- 04 | Continuous low-temperature harvesting and storage of medium or virus medium
- 05 | Low temperature storage

SPECIFICATION

Control system ※	Siemens color touch screen, Ethernet interface, USB interface
Storage bag ※	Standard bags or customization
Container Type ※	Round and square
Load cell ※	Optional
pH ※	Optional
Conductivity ※	Optional
Temperature ※	Optional
Dissolved oxygen ※	Optional
Jacket design ※	Optional. For low-temperature mixing
Software design ※	Optional. 3 level security, audit trail, batch report, electronic signature, and GMP standards
Needle printer ※	Optional
Operating temperature	No more than 45°C

Note: ※ Optional

SPECIFICATION

Volume	50L	100L	200L	500L	1000L	2500L
Design	Discharge from bottom. Sampling ports/addition ports and probe ports in the side					
Material	SS304					
Surface polished	Ra ≤ 0.6μm					
Trundle	Large castor and polyurethane material					
Installation	Side operation door					

CONTAINER

PP material, used for stacking storage and handling of a large amount of liquid, fold-able placement, saving space, 50L, 200L, 500L, 1000L, etc. optional.

Fold-able plastic Container



HDPE material, used for the storage and transportation. 50L, 200L, 500L, 1000L, etc. optional.

SPECIFICATION

Volume	50L	100L	200L
Material	HDPE plastic		
Trundle※	Large castor and polyurethane material		
Installation※	Side operation door		

Round container

Transfer Base



Note: ※Optional

SPECIFICATION

volume	50L	100L	200L	500L	1000L	2500L
Material	SS304					
Installation※	Side operation door					

Square Stainless Steel Container



Note: ※Optional

PROJECT SITE





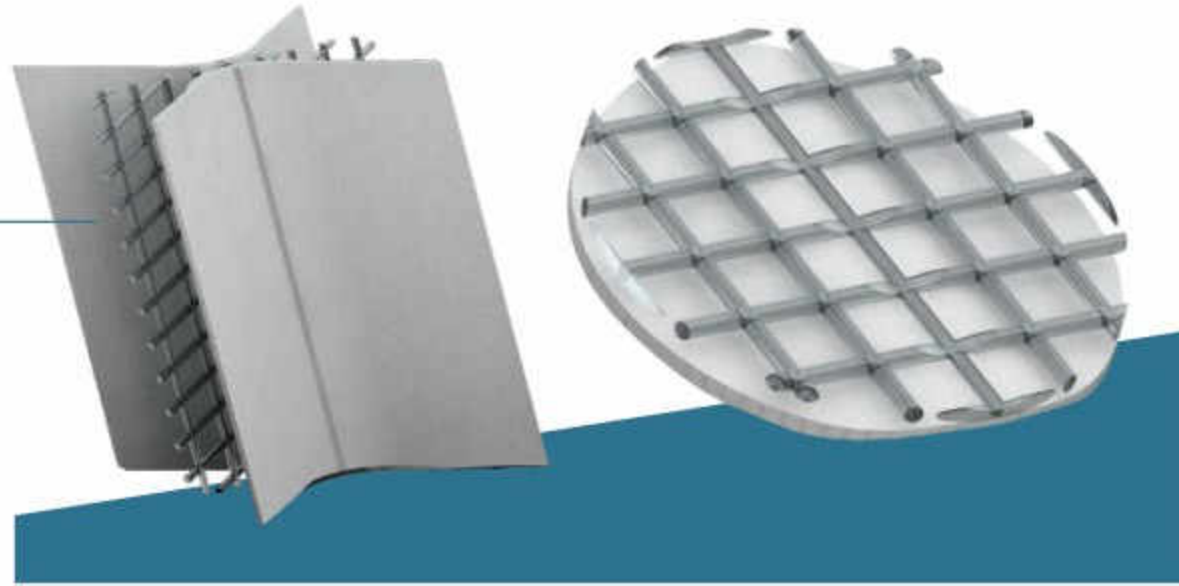
PRODUCT INTRODUCTION



FABRIC CARRIER

Three-layer diamond fabric carrier

Disk fabric carrier



Three-layer diamond fabric carrier and disk fabric carrier, the adherence surface area is 1200 cm²/g.

DESCRIPTION

The fabric carrier is a carrier applied for the cultivation of animal cell adherent cells, which provides a large adherent area for cell growth and realizes high-density cell culture.

The fabric carrier is composed of stable polyester fiber and polypropylene stent suitable for cell growth. It is made by welding, molding, cleaning, charge treatment and other processes. Animal-derived component-free(ADCF)

APPLICATION

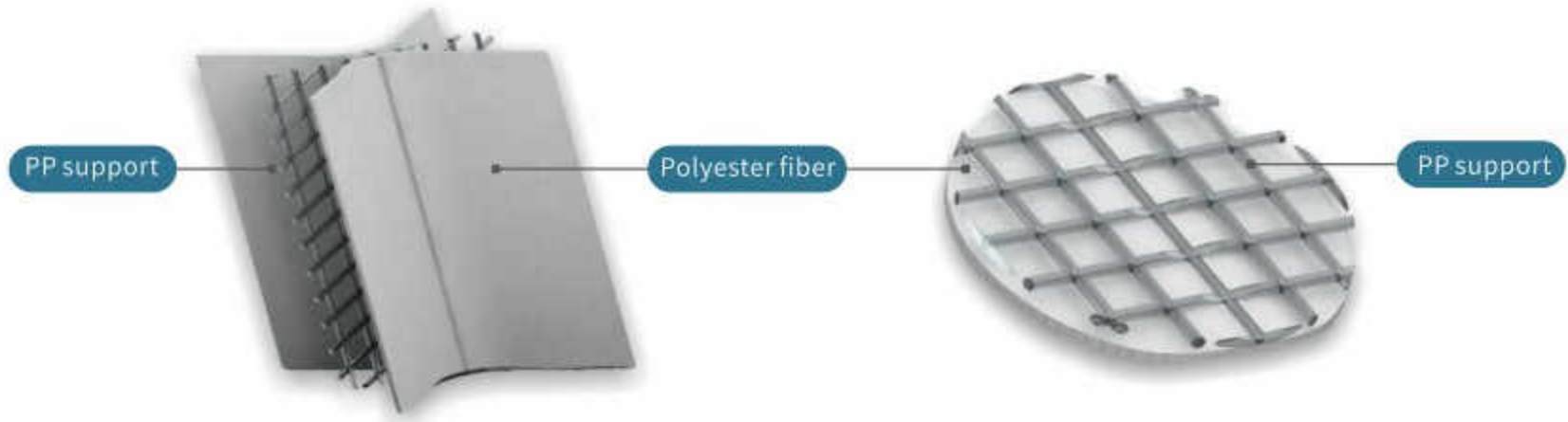
It is suitable for mammalian/insect cell culture. It is mainly used for the production of secreted products, e.g. genetic recombination proteins/virus vaccines etc. Now, it can also be used to harvest cells, e.g. stem cells/immune cells etc.

Fabric carriers have been widely used in R&D, e.g. human rabies vaccines/IPV/EV71 vaccines /influenza vaccines/COVID-19/swine fever vaccines/avian flu vaccines/pseudo-rabies vaccine/porcine diarrhea vaccines/EPO/TPO protein drugs/Viral vectors (LV, AAV, ADV, RV, HSV, etc.)/cell therapy, etc. The cell lines that have been cultured include: VERO, CHO, BHK, MDCK, ST, MARC-145, ES, MSC, CEF, MRC-5, SF9, HEK-293, 123A, 127A, GAMMA and primary cells.



Patent No.
201821283990.4
201810905734.2

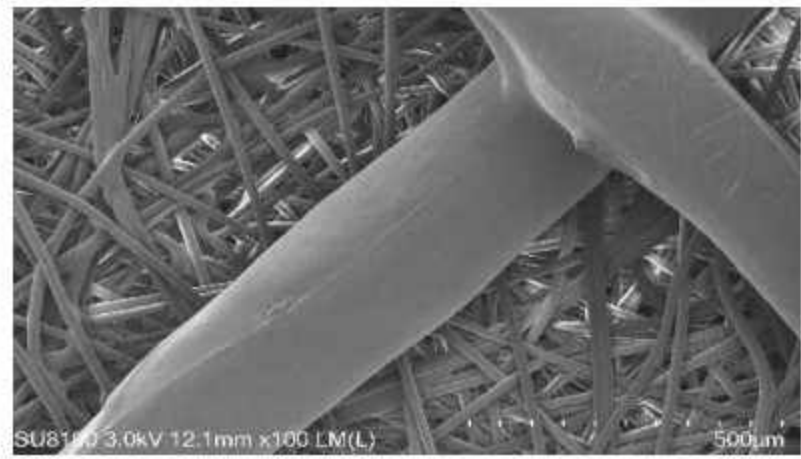
STRUCTURE



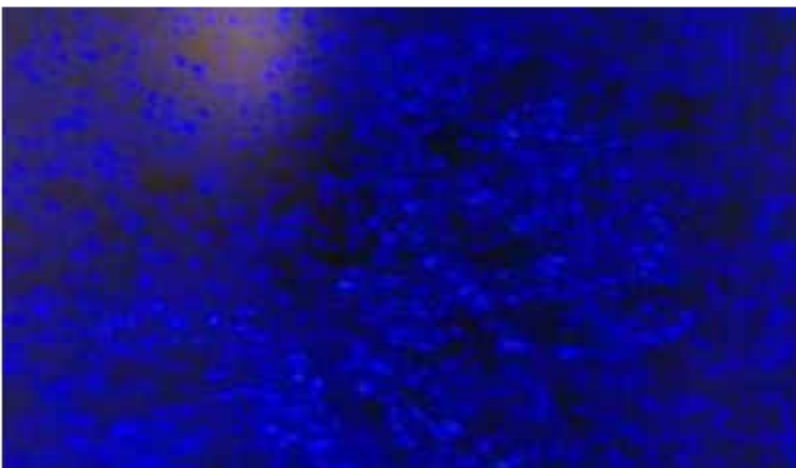
VIEW



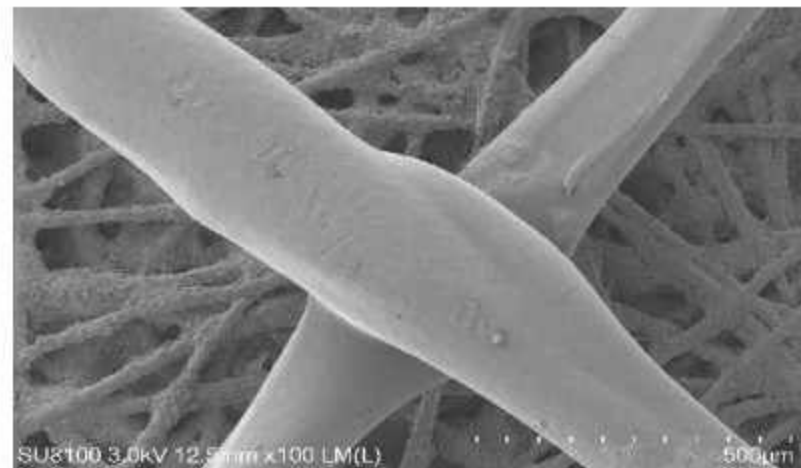
Microscope image



Electron micro-graph of fabric carrier image



Fluorescence image

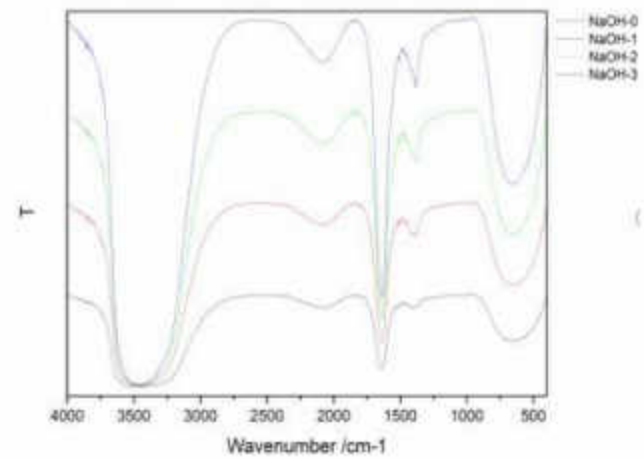
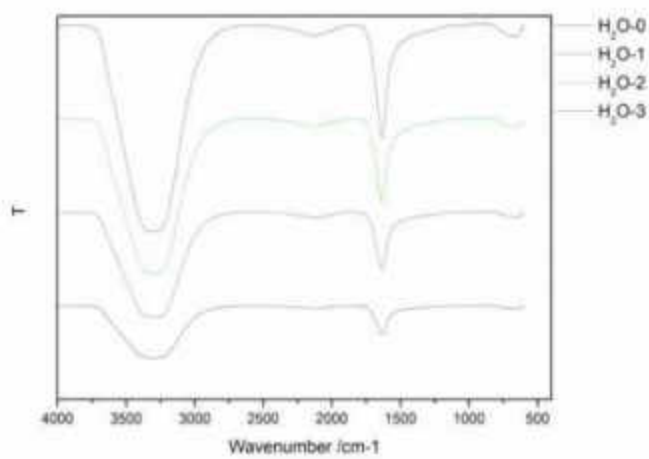


Electron micro-graph of cell image

INFRARED SPECTROGRAM

Soak in ultrapure water overnight, 121°C, 60min sterilization

Soak in 0.5mol NaOH for 24H



ADVANTAGE

CERTIFICATION

01

Meet requirements of declarations in domestic and abroad.

PERFUSION

02

Separate the medium/cells/harvest products/perfusion culture.

HIGH DENSITY

03

High area/volume ratio with high density.

EASY TO CELL CULTURE

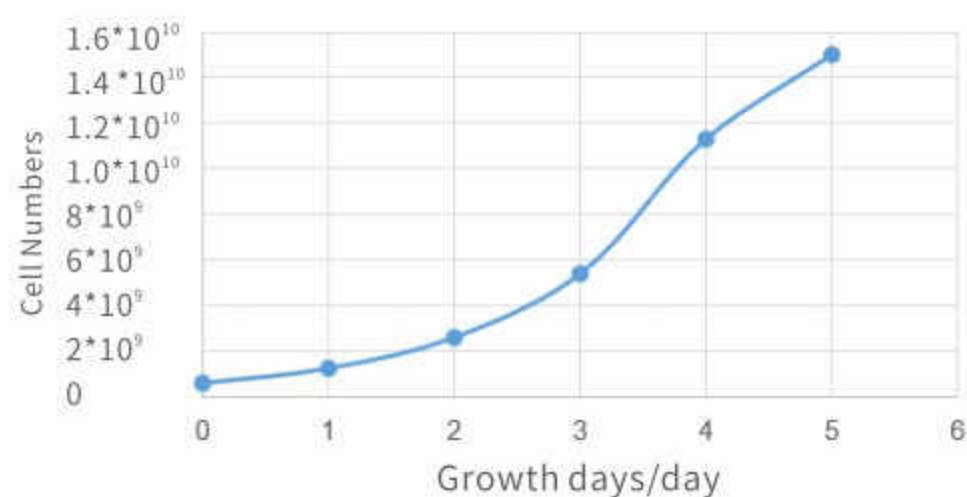
04

Similar to the static state of a spinner flask. Simple and easy to control.

CELL CULTURE CASE

Wuhan CEKG Technology Co., Ltd. data sheet of 2L volume fabric carrier bag
Cell type: VERO; Inoculation density: 3.5×10^5 cells/ml; Working volume: 1L; Growth days: 5 days.

VERO cell growth curve



ORDER INFORMATION

Model NO.	Description (Name, Specification, Size, Configuration)
SKC0101-0050	Fabric carrier/Disk-Fabric, double-layer, 50g/bag
SKC0101-0050G	Fabric carrier/Disk-Fabric, double-layer, Gamma irradiation, sterility, 50g/bag
SKC0101-0250	Fabric carrier/Disk-Fabric, double-layer, 250g/barrel
SKC0101-0250G	Fabric carrier/Disk-Fabric, double-layer, Gamma irradiation, sterility, 250g/ barrel
SKC0101-1000	Fabric carrier/Disk-Fabric, double-layer, 1000g/bag
SKC0101-1000G	Fabric carrier/Disk-Fabric, double-layer, Gamma irradiation, sterility, 1000g/bag
SKC0102-0050	Fabric carrier/Diamond-Fabric, three-layer, 50g/bag
SKC0102-0050G	Fabric carrier/Diamond-Fabric, three-layer, Gamma irradiation, sterility, 50g/bag
SKC0102-0250	Fabric carrier/Diamond-Fabric, three-layer, 250g/bag
SKC0102-0250G	Fabric carrier/Diamond-Fabric, three-layer, Gamma irradiation, sterility, 250g/ bag
SKC0102-1000	Fabric carrier/Diamond-Fabric, three-layer, 1000g/bag
SKC0102-1000G	Fabric carrier/Diamond-Fabric, three-layer, Gamma irradiation, sterility, 1000g/bag

CRITERION

Test item	Specification	Test standard
Bioburden	<0.5 (CFU/g)	ISO 11737-1:2006
Endotoxin	<0.05 (EU/ml)	Chinese Pharmacopoeia 2015.Vol IV:1143
Cytotoxicity	Grade "0"	ISO 10993-5-2009

CEKG 武汉赛科成科技有限公司
WUHAN CEKG TECH. CO., LTD

质量报告

产品名称: 可欣软管 型号: M0100-1000
 数量: 1000000 供货规格: 100μm/卷
 生产日期: 2024.02.29 有效期至: 2025.02.17

本批次所有产品均符合以下检测标准:

检测项目	检测标准	检测依据	结果
生物负载	GB 8167-2013	ISO 11737-1:2006	符合规定
内毒素	GB 8167-2013	中国药典 2015 版 (通则) 通则 1143	符合规定
细胞毒性	GB 8167-2013	ISO 10993-5:2009	符合规定

质量负责人: [Signature] 报告日期: 2024.02.29

SGS

检测项目: 生物负载

客户: 武汉赛科成科技有限公司

样品名称: 可欣软管

规格: M0100-1000

数量: 1000000

检测标准: ISO 11737-1:2006

检测项目	检测结果	规格要求	判定
生物负载	100 CFU/g	< 0.5 CFU/g	合格

报告日期: 2024.02.29

SGS

检测项目: 细胞毒性测试 (浸提液测试)

客户: 武汉赛科成科技有限公司

样品名称: 可欣软管

规格: M0100-1000

数量: 1000000

检测标准: ISO 10993-5:2009

检测项目	检测结果	规格要求	判定
细胞毒性	Grade 0	Grade 0	合格

报告日期: 2024.02.29

SGS

检测项目: 内毒素

客户: 武汉赛科成科技有限公司

样品名称: 可欣软管

规格: M0100-1000

数量: 1000000

检测标准: GB 8167-2013

检测项目	检测结果	规格要求	判定
内毒素	< 0.05 EU/ml	< 0.05 EU/ml	合格

报告日期: 2024.02.29

SGS

检测项目: 细胞毒性测试 (浸提液测试)

客户: 武汉赛科成科技有限公司

样品名称: 可欣软管

规格: M0100-1000

数量: 1000000

检测标准: ISO 10993-5:2009

检测项目	检测结果	规格要求	判定
细胞毒性	Grade 0	Grade 0	合格

报告日期: 2024.02.29

SGS

检测项目: 生物负载

客户: 武汉赛科成科技有限公司

样品名称: 可欣软管

规格: M0100-1000

数量: 1000000

检测标准: ISO 11737-1:2006

检测项目	检测结果	规格要求	判定
生物负载	100 CFU/g	< 0.5 CFU/g	合格

报告日期: 2024.02.29



SKC600 BIOREACTOR

PRODUCT INTRODUCTION



INTRODUCTION

SKC600 bioreactor is developed for cell culture. It uses a rocker platform to place single-use suspension cell culture bags or single-use fabric carrier culture bags(produced by ourselves). Also It can control the rocker speed, tilt angle, gas flow, temperature, pH, DO, concentration of CO2 and O2 and weight.

SKC600 bioreactor supports the replacement of trays of different sizes. 10L trays (2L, 5L, 10L culture bags), 20L trays (20L culture bags) and 50L trays (50L culture bags) optional.

CONTROL MODE

Independent control and tray replacement

One controller can control one rocker and replace different trays easily.



Parallel control and multiple control

2-8 rockers can be controlled by a computer.





Testing site

HMI

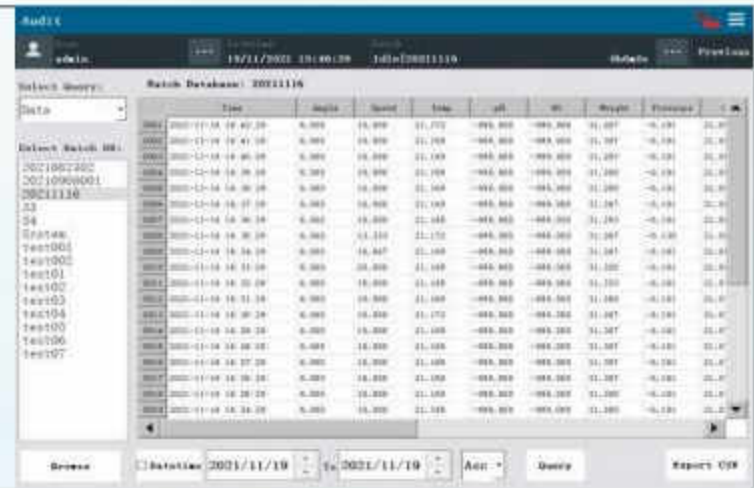
Flow chart

Parameter control, sampling control and inflation rapid



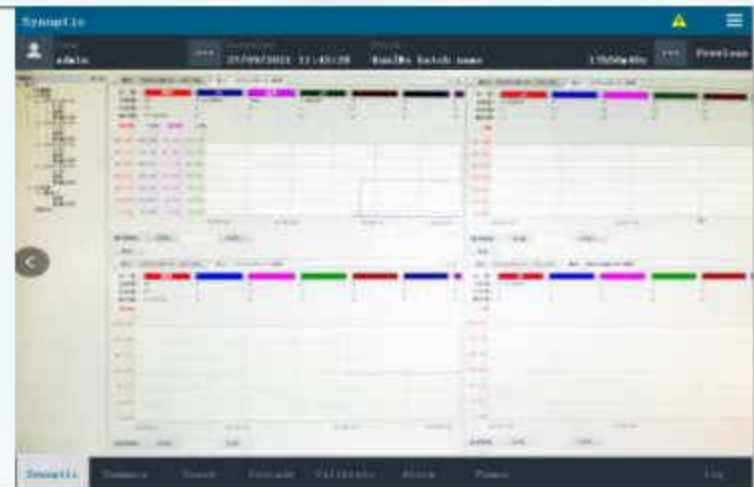
Audit tracking

Data records, operation logs, batch reports, etc.



Parallel control software

Parallel controlling and monitoring of multiple rocker bioreactors



FEATURE

- 01** **Tray replaced rapidly**
10L trays, 20L trays, 50L trays replaced easily
- 02** **Suspension culture and adherent culture**
Suitable for different cell culture bags, e.g. suspension cell culture and adherent cell culture. Continuous perfusion culture for adherent cell is achieved easily with our patented fabric carrier bag
- 03** **Batch culture and perfusion culture of suspension cells**
Perfusion membrane cell culture bag is used for the perfusion culture and high-density culture of suspension cells and the N-1 scale-up
- 04** **Adherent cell trypsinization, transfer and scale up**
Fabric carrier cell culture bags can achieve amount cell culture adherent, and then trypsinizate and prepare amount adherent seed cells into next process

SPECIFICATION

Tray size	10L			20L	50L
Total volume (suspension culture)	2L	5L	10L	20L	50L
Total volume (adherent culture)	2L	5L	10L	20L	50L
Max. working volume	1L	2.5L	5L	10L	25L
Control system	Siemens PLC, 15-inch color touch screen, Ethernet interface, USB interface				
Temperature control	Heating plate, PID automatic control, accuracy: $\pm 0.2^{\circ}\text{C}$; Temperature control range: 5-40 $^{\circ}\text{C}$ above				
Rocker speed	1-40rpm				
Tilt angle	1-12 $^{\circ}$				
Gas ※	3 thermal mass flow controllers (Air/O ₂ /CO ₂), 1 thermal mass flow controller with 3 gas mixer optional				
Exhaust ※	Exhaust condenser, exhaust filter heater optional				
Exhaust analysis	O ₂ (0-50%), CO ₂ (0-15%)				
Pressure detection	Range:-100mbar----100mbar; Stop air intake when it is exceeded.				
pH	Single-use pH probe, control range: 6-8, accuracy: $\pm 0.05\text{pH}$; PID control; cascaded by gas flow, peristaltic pump, etc.				
DO	Single-use DO probe, control range: 0-100%, accuracy: $\pm 3\%$; PID control; cascaded by rocker speed, MFC, etc.				
Pumps※	4 fixed-speed peristaltic pumps, customized feeding/acid feeding /alkali feeding/ discharging etc. 25RPM or 100RPM variable speed optional				
Load cell	Load: 0-50kg, accuracy: $\pm (0.050 + 1\% \text{ loading sampling}) \text{ kg}$; cascaded by pumps				
Utilities	Air/O ₂ /CO ₂ , pressure: 15-20PSIG				
Signal interface※	Optional				
Power supply	AC220V, 50/60HZ, 10A				

Note: ※Optional



SKC600 200L BIOREACTOR

PRODUCT INTRODUCTION



200L INTRODUCTION

SKC600 200L bioreactor is developed for cell culture. It uses a rocker platform to place single-use suspension cell culture bags or single-use fabric carrier culture bags(produced by ourselves). Also It can control the rocking speed, tilt angle, gas flow, temperature, pH, DO, concentration of CO2 and O2 and weight.

It is used for GMP production line, and also prepare suspended seed cells or adherent seed cells for large-scale stainless steel/single-use bioreactors more than 200L.

One 200L or two 100L cell culture bags optional.

200L FEATURE

- | | |
|---|--|
| <p>01 For suspension cell culture and adherent cell culture</p> <p>02 Compatible with batch cell culture and perfusion cell culture</p> <p>03 Trypsinization, transfer and scale up</p> <p>04 Process scaled-up</p> | <p>05 Cell culture bags are produced by ourselves with validation and stable long-term supply</p> <p>06 Monitored the whole production process and software to meets requirements of GMP</p> <p>07 Freeze-thawing and lysis</p> |
|---|--|

200L APPLICATION

- | | |
|---|---|
| <p>01 Cultivation of mammalian cells/insect cells/
plant cells/bacteria/immune cells/stem cells.</p> | <p>06 R&D and production for virus vaccines</p> |
| <p>02 Seed preparation for suspension and adherent cells.</p> | <p>07 R&D and production for protein products</p> |
| <p>03 Preparation of virus seeds for suspension and
adherent cells.</p> | <p>08 R&D and production for cell growth factors</p> |
| <p>04 Suspension culture and adherent culture of CAR-T,
CAR-NK and other immune cells in cell therapy.</p> | <p>09 R&D and production for viral vectors</p> |
| <p>05 Suspension culture and adherent culture for
IPS and MSC etc.</p> | <p>10 R&D and production for cell exosomes</p> |

200L SPECIFICATION

Control system	Siemens PLC, 15-inch color touch screen, Ethernet interface, USB interface
Temperature control	Heating plate, PID automatic control, accuracy: $\pm 0.2^{\circ}\text{C}$; Temperature control range: 5-40 $^{\circ}\text{C}$ above
Rocker speed	1-25rpm
Tilt angle	1-10 $^{\circ}$
Gas ※	3 thermal mass flow controllers (Air/O ₂ /CO ₂), 1 thermal mass flow meter with 3 gas mixer optional
Exhaust ※	Exhaust condenser, exhaust filter heater optional
Exhaust analysis	O ₂ (0-50%), CO ₂ (0-15%)
Pressure detection	Range: -100mbar---100mbar; Stop air intake when it is exceeded.
pH	Single-use pH probe, control range: 6-8, accuracy: $\pm 0.05\text{pH}$; PID control; cascaded by MFC, peristaltic pump, etc.
DO	Single-use DO probe, control range: 0-100%, accuracy: $\pm 3\%$; PID control; cascaded by rocker speed, MFC, etc.
Pumps ※	4 fixed-speed peristaltic pumps, 25RPM or 100RPM variable speed optional
Load cell	Load: 0-200kg, accuracy: $\pm (0.050 + 1\% \text{ loading sampling}) \text{ kg}$; cascaded by pumps optional
Utilities	Air/O ₂ /CO ₂ , pressure: 15-20PSIG
Signal interface ※	Optional
Power supply	AC220V, 50/60HZ, 10A

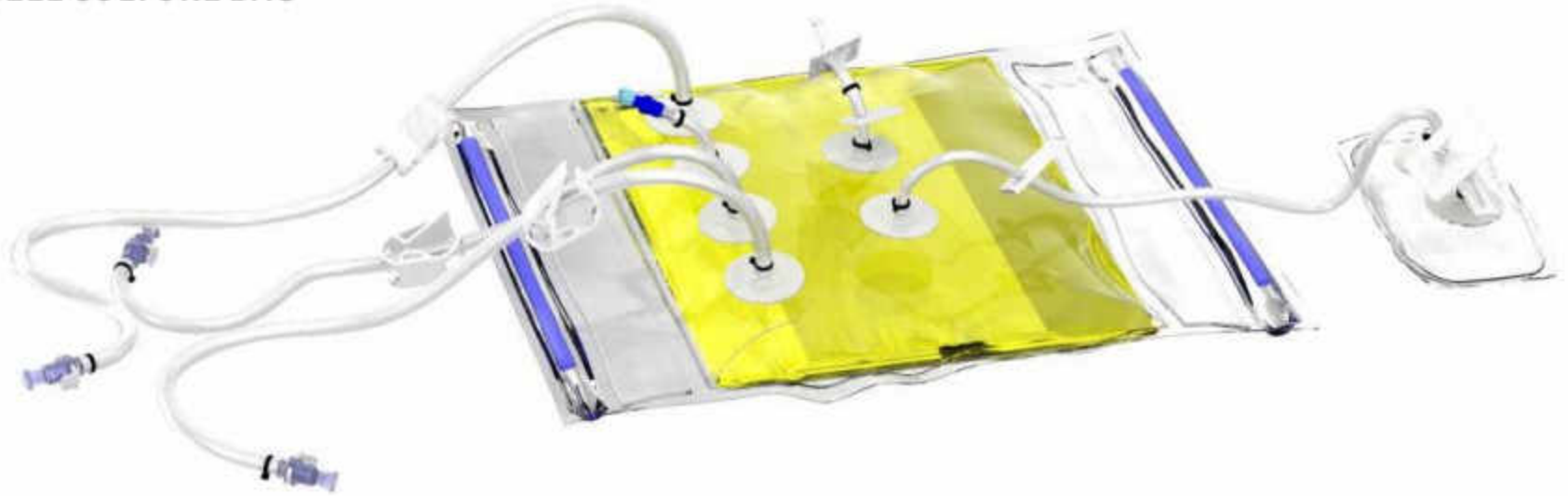
Note: ※Optional



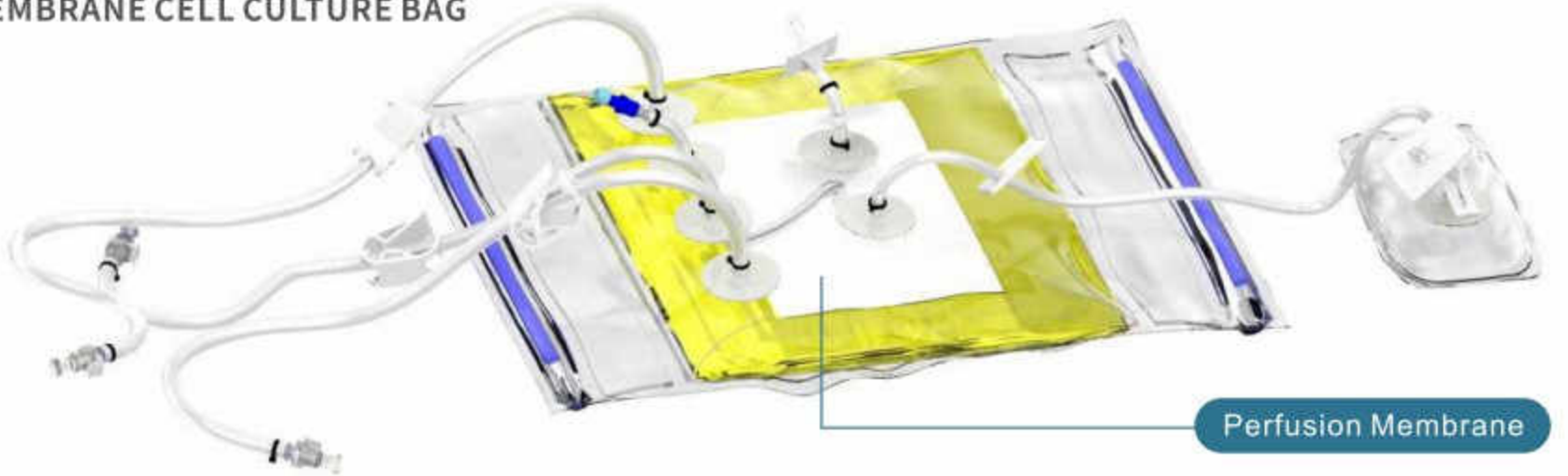
SKC600 MATCHING BAG

PRODUCT INTRODUCTION

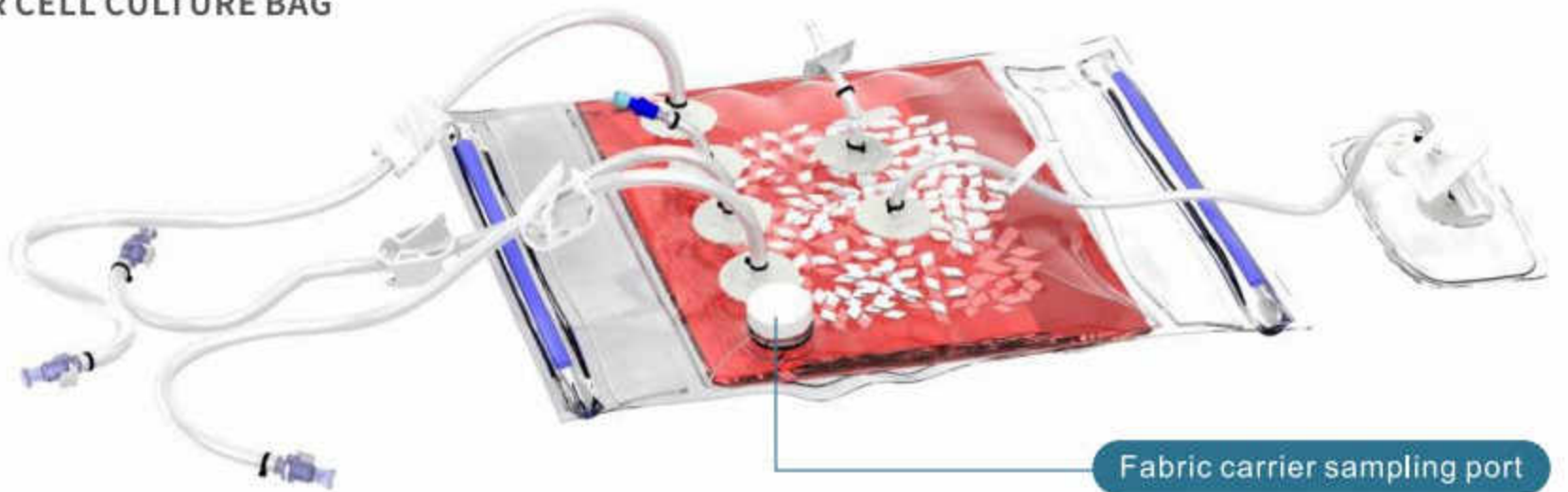
SUSPENSION CELL CULTURE BAG



PERFUSION MEMBRANE CELL CULTURE BAG



FABRIC CARRIER CELL CULTURE BAG



SUSPENSION CELL CULTURE BAG AND PERFUSION MEMBRANE CELL CULTURE BAG

INTRODUCTION

Suspension cell culture bag can culture suspension cells.

Perfusion membrane cell culture bag can carry on metabolism of suspension cell culture to achieve ultra-high density cell culture and continuous perfusion cell culture.



FEATURE

N-1 SCALE UP

Q1

Scale-up of N-1 can be achieved easily, saving 1-2 larger bioreactors

HIGH DENSITY PERFUSION

Q2

Ultra-high-density cell culture and continuous perfusion cell culture

STERILE AND ENCLOSED

Q3

Good stability, sealed condition and less contamination

CUSTOMIZED

Q4

Customized

APPLICATION

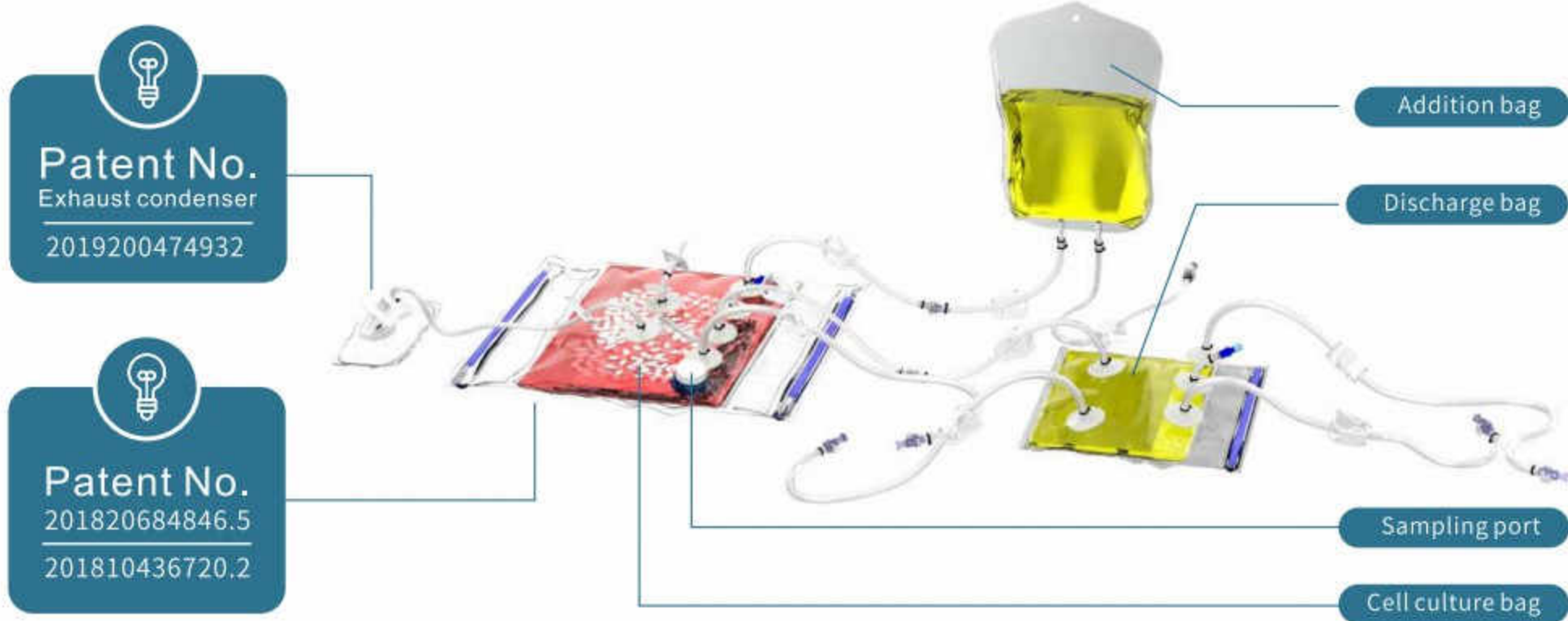
- 01 | Seed cell culture and N-1 scale up cell culture of protein drugs/antibodies
- 02 | Higher density cell culture of mammalian cells/insect cells/plant cells/bacteria/immune cells/stem cells
- 03 | Preparation of virus seeds

- 04 | Preparation of virus vaccines, e.g. swine fever/rabies/flu etc.
- 05 | Suspension cell culture and enrichment of CAR-T, CAR-NK etc.
- 06 | Suspension cell culture for IPS and MSC etc.

FABRIC CARRIER CELL CULTURE BAG

INTRODUCTION

Fabric carrier bag can achieve adherent cells culture by suspension mode. Fabric carrier is pre-filled into single-use bag and pre-sterilization. The adherent cells will adhere and grow in the fabric carrier and the fabric carrier with cells suspend in the medium. The cells or secreted products can be harvested through ourselves' patented technology.



FEATURE

MATRIX AND REPLACEMENT

Q1

Large adherence area, instead of cell factory, bottles to prepare the seed cell and seed virus

TRYPsinIZATION & TRANSFERANCE

Q3

To achieve adherent cell culture scale up by trypsinization

HIGH DENSITY

Q5

High-density cells and viruses

STERILITY AND STABILITY

Q7

Good stability and single-use enclosed condition

SAMPLING FEBRIC CARRIER

Q2

Sampling of fabric carrier and counting cell density

CONTINUOUS PERFUSION

Q4

Continuous perfusion cell culture

CERTIFICATION

Q6

Meet requirements of declarations in domestic and abroad

FREEZE THAWING AND SPLITTING

Q8

Freeze-thawing and lysis of bags

APPLICATION

- | | |
|--|---|
| <p>01 Adherence cell culture of mammalian cells/ insect cells/plant cells/bacteria/immune cells/ stem cells</p> | <p>06 R&D and production process for viral vectors, e.g. LV (Lentivirus)/ADV(Adenovirus)/AAV (Adeno-associated virus)/RV (Retrovirus)/HSV (Oncolytic virus) etc.</p> |
| <p>02 High-density cell culture of hybridoma cells/ stem cells etc.</p> | <p>07 R&D and production for protein drug, e.g. EPO/TPO/TPA, etc.</p> |
| <p>03 Seed and virus preparation for adherent cells.</p> | <p>08 R&D and production process for cell exosomes</p> |
| <p>04 R&D for cell growth factors</p> | <p>09 R&D and production for human virus vaccines, e.g. COVID-19 vaccine/rabies vaccine/EV71 vaccine/IPV vaccine/influenza vaccine/vaccinia, etc.</p> |
| <p>05 Adherent cell culture of IPS and MSC etc.</p> | <p>10 R&D and production for animal virus vaccines, e.g. swine fever/PRRS/swine diarrhea /swine gastroenteritis/ avian influenza/pseudorabies etc.</p> |

COMPARASION DATA BETWEEN FABRIC CARRIER AND ALTERNATIVE PRODUCTS

Total volume of carrier bag	2L	5L	10L	20L	50L	100L	200L
Working volume	1L	2.5L	5L	10L	25L	50L	100L
Fabric carrier quantity	30g	75g	150g	300g	750g	1500g	3000g
Adherence area	36000cm ²	90000cm ²	180000 cm ²	360000cm ²	900000cm ²	1800000 cm ²	3600000 cm ²
15000 spinner bottles	16个	40个	80个	160个	400个	800个	1600个
T225 square bottles	160个	400个	800个	1600个	4000个	8000个	16000个
Single layer cell factory	56个	141个	283个	566个	1415个	2830个	5660个

SPECIFICATION

Type	Suspension cell culture bag	Perfusion membrane cell culture bag	Fabric Carrier Cell Culture Bag
Total volume	2L/5L/10L/20L 50L/100L/200L	2L/5L/10L/20L 50L/100L/200L	2L/5L/10L/20L 50L/100L/200L
Working volume	10%-50% of total volume	10%-50% of total volume	50% of total volume
Carrier quantity/ surface area	No	No	30g/L, the specific surface of the carrier is 1200cm ² /g
Perfusion membrane	No	Yes	No
Package	Double separate packing		
Sterilization	R-ray irradiation sterilization (25-40kGy)		
Temperature	-45 to +45 degrees		



SKC900 STIRRED BIOREACTOR

PRODUCT INTRODUCTION



INTRODUCTION

SKC900 single-use stirred bioreactor is including the excellent mixing and stirring effects of traditional stirred bioreactor, besides it' s including single-use advantages of easy operation, no need for cleaning validation, and no need for sterilization, therefore It is an ideal equipment for production of vaccine, recombination protein and monoclonal antibody.

SKC900 single-use stirred bioreactor composed of a stainless steel container, a single-use cell culture bag and a controller equipped with excellent sensors.

SKC900 single-use stirred bioreactor can match the bags volume from 50L to 2000L, and is easy to achieve suspension cell culture and micro-carrier/fabric carrier adherent cell culture.

SKC900 single-use stirred bioreactor can simplify the scale-up process, and be easily converted between stainless steel and single use bioreactors, reduce the risk of bioprocess transfer.

FEATURE

- 01 **Sterility/enclosed/low cost:** Enclosed environment with low contamination risks and less maintenance
- 02 **Convenient validation and operation:** No need for cleaning and sterility validation with low contamination risks

- 03** | **Own culture bags:** Cell culture bags are produced by ourselves with validation and stable long-term supply
- 06** | **Scale-up:** 50L to 2000L available
- 04** | **Validation support:** providing validation services of single-use cell culture bags and bioreactors
- 07** | **Monitoring:** Monitoring cell culture process
- 05** | **Customization:** Replace abroad bags or bioreactor bags
- 08** | **GMP standards:** 3 level security/electronic signature/audit trail/GMP standards

APPLICATION

Suspension cell culture

Adherent cell culture on micro-carriers or fabric carriers

Culture of mammalian cells/insect/stem cells

Medium and low density microbial cell culture

Pilot scale production

R&D scale-up process

Large-scale seed culture

Production of vaccines, recombination proteins and antibodies

SPECIFICATION

Container size	50L	200L	500L	1000L	2000L
Bag volume	50L	200L	500L	1000L	2000L
Controller system	Siemens PLC, 15-inch Siemens color touch screen, Ethernet interface, USB interface.				
Temperature control	Water jacket, PID automatic control, Pt100 sensor, accuracy $\pm 0.5^{\circ}\text{C}$, PID control, temperature range 8-45 $^{\circ}\text{C}$, Max. 60 $^{\circ}\text{C}$				
Max. speed	360RPM	350RPM	250RPM	140RPM	115RPM
Gas ※	4 thermal mass flow controller(Air/O ₂ /N ₂ /CO ₂), 1 thermal mass flow controller with 3 gas mixer and overlay optional				
Exhaust ※	filter heater/0.2 μm air filter				
Exhaust analysis	O ₂ (0-50%), CO ₂ (0-15%)				
Gas pressure control	Measured and controlled				
pH ※	1.Single-use fiber pH probe, control range: 6-8, accuracy: $\pm 0.05\text{pH}$; PID control; cascaded by peristaltic pump/carbon dioxide concentration etc.				
	2.Repeatable use of traditional pH probe with sterilizable electrode adapter, control range: 4-10, PID control, cascaded by peristaltic pump, carbon dioxide concentration, etc.				
DO ※	1. Single-use fiber DO electrode, range: 0-100%, PID control; cascaded by rocker speed/MFC etc.				
	2.Repeatable use of traditional DO probe with sterilizable electrode adapter, range: 0-100%,PID control, cascaded by rocker speed/MFC etc.				
Pumps ※	4 fixed-speed pumps for addition/acid/base/anti-foam etc., 25PRM/100PRM variable-speed pumps optional				
Load cell ※	Optional				
Signal interface ※	Optional				
Utilities	Air/O ₂ /N ₂ /CO ₂ ; Requirement :30-35 psig				
Power supply	AC220V,50/60Hz,20A				

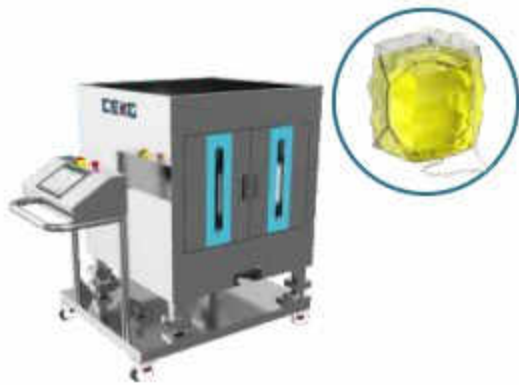
Note: ※ Optional



PROCESS APPLICATION

PROCESS APPLICATION

VECTOR VIRUS PROCESS FLOW



Medium preparation



Medium balance



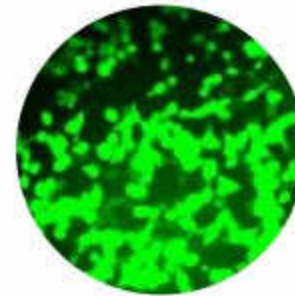
Inoculation seed cells



Circulating or perfusion cell culture



Cell growth monitoring



Inoculation virus or transfection



Batch/continuous harvesting virus

PERFUSION MEMBRANE N-1 SCALE-UP PROCESS FLOW



2x5mL centrifuge tubing (5×10^7 cells/ml)



Perfusion membrane cell culture (1L, 4×10^5 cells/ml)



Perfusion membrane perfusion cell culture (10L, 8×10^7 cells/ml)



2000L single-use bioreactor.

STEM CELL CULTURE PROCESS FLOW



Medium preparation



Medium balance



Inoculation cells



Circulating perfusion cell culture



Growth monitoring

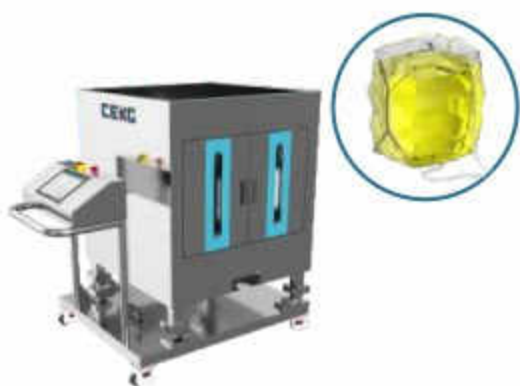


The supernatant

Cells

Harvesting the supernatant/cells

IMMUNE CELL CULTURE PROCESS FLOW



Medium preparation



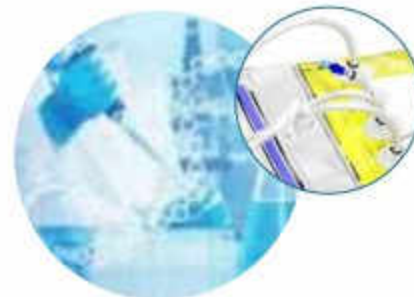
Medium balance



Inoculation cells



Perfusion membrane perfusion cell culture



Growth monitoring



Harvesting immune cells

VACCINE/VIRUS/CELL PRODUCTION SCALE-UP PROCESS FLOW

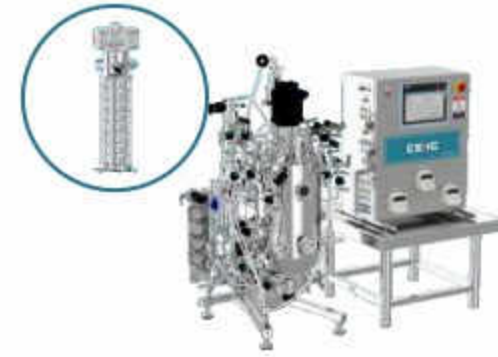
Scale-up process from fabric carrier cell culture to micro-carrier cell culture



Fabric carrier shake flask culture



Scale-up culture of 5L fabric carrier bag, trypsinization of adherent cells



14L/40L micro-carrier culture bioreactor

Scale-up process of fabric carrier bag cell culture and trypsinization



The fabric carrier shake flask culture, harvest the total number of $(5-15) \times 10^8$ cells, and inoculate it on a 5L fabric carrier bag, the inoculation density is $(2-6) \times 10^5$ cells/ml



5L culture bag grows for 5-7 days and digest, then inoculate it into 1-3 per 50L fabric carrier bags



50L culture bag grows for 5-7 days and digest, then harvests $(1-1.5) \times 10^{11}$ cells, therefore can inoculate multiple 200L fabric carrier bags or bioreactors, inoculation density is 6×10^5 cells/ml



Multiple 200L fabric carrier bag/ bioreactor culture for production



293T CULTURE PROCESS OF FABRICE CARRIER CULTURE BAG



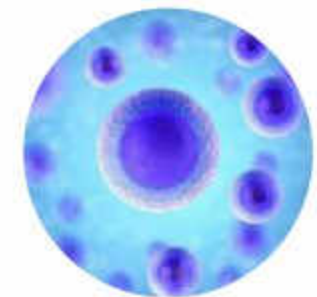
Fabric carrier shake flask 293T culture, and trypsinized and then inoculate 3×10^5 cells



2L Culture bag grows for 5-7 days and trypsinized, then take out 2×10^8 cells inoculate into 50L culture bag



Culture bag 50L grow for 72 hours, change the medium, transfect, then change the medium for 6 hours, and culture for 90 hours by circulate perfusion



Harvest. Trypsinized from fabric carrier and then lysed, or lysed by lysate



SKC300 BIOREACTOR

PRODUCT INTRODUCTION



INTRODUCTION

Adopts brand components from domestic and abroad. The equipment has a neat appearance, easy to clean and sterilize, concise human-machine interface, stable process control and convenient operation.

It is a highly versatile bioreactor, compatible with most mainstream cell culture stirring blades and bioreactors.

FEATURE

- 01 Multiple Impellers
 - Pitched blade impeller or spin filter type Impeller for suspension cell culture
 - Packed-bed basket Impeller for adherent cell perfusion culture
 - Cell lift Impeller for Micro-carrier culture
- 02 Multiple water-jacketed vessel: 2.5L, 5.0L, 7.5L and 14.0L optional
- 03 Preset control algorithm: Preset pH, DO, gassing (four gas mixture and gas flow), temperature and others, easier to culture
- 04 Multiple cascades: Customized parameter cascade/time cascade/alarm correlation algorithms
- 05 Siemens PLC control system: Controlling stirring speed/temperature/PH/DO/gassing/anti-foam/liquid level etc.
- 06 Modular design: Flexible and easy to maintain
- 07 Power-off self-recovery: Automatically recover the state before power-off
- 08 Industrial Ethernet: Control multiple devices remotely and portable devices optional

HMI

01

SIEMENS 12 INCH FULL-COLOR TOUCH SCREEN

Siemens 12-inch full-color touch screen is adopted to record and save process data in real time so as to meet GMP standards on drug production.

02

PARAMETER SETTINGS

Clear parameter setting screen, trend in real time and history, alarm setting, simple and friendly human-computer interface to show control process.

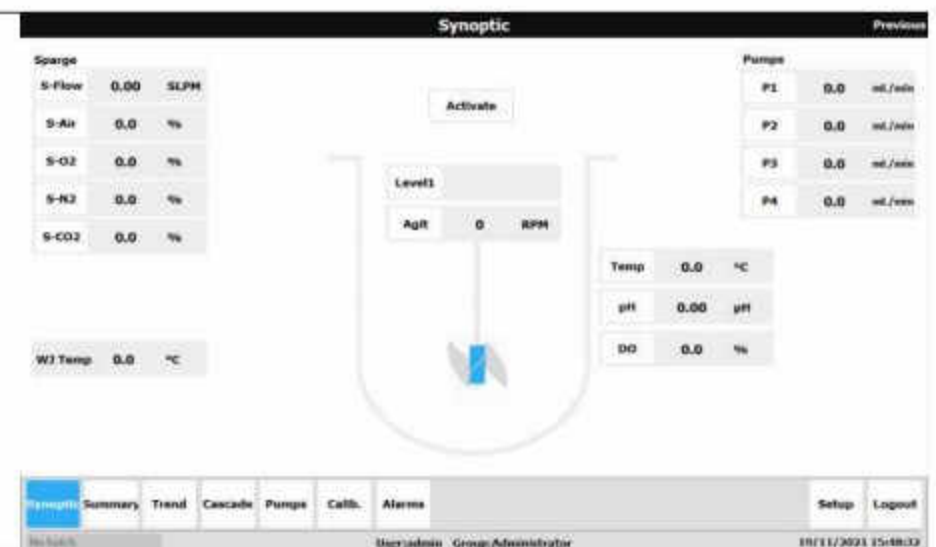
03

THREE-LEVEL SECURITY MANAGEMENT

3 level security, electronic signature, audit trail, batch report, log record and GMP standards

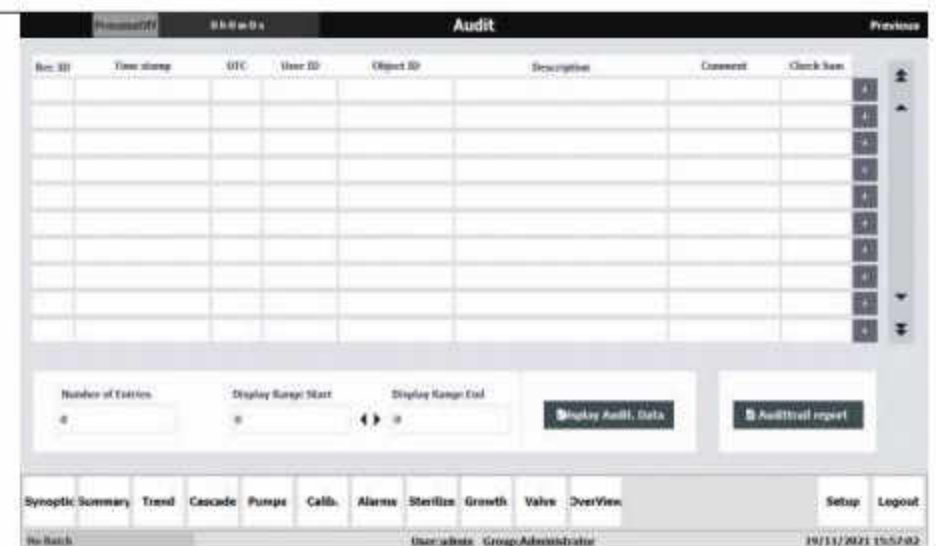
Flow chart

Simple process interface includes system activation/gasmixing/agitation/temperature/pumps/pH and DO control/water jacket and cabinet temperature display



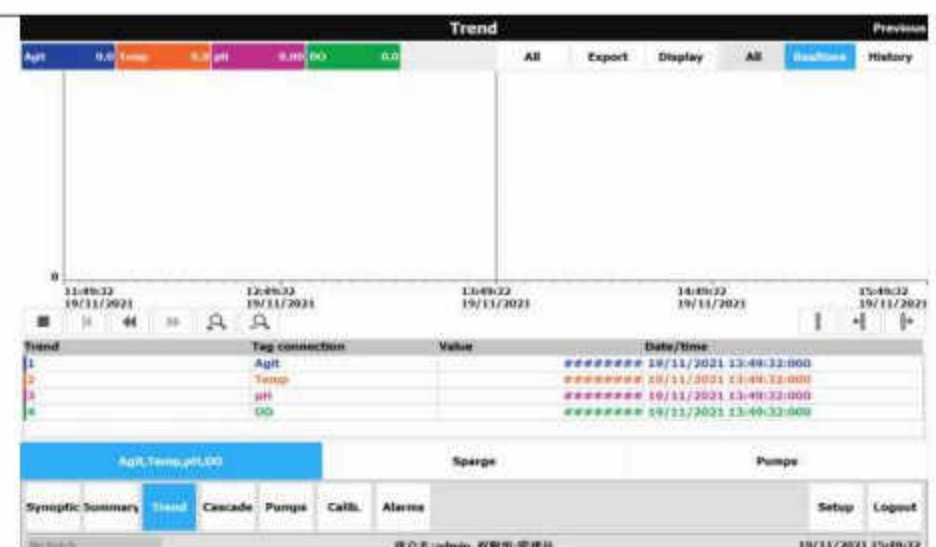
Spurge

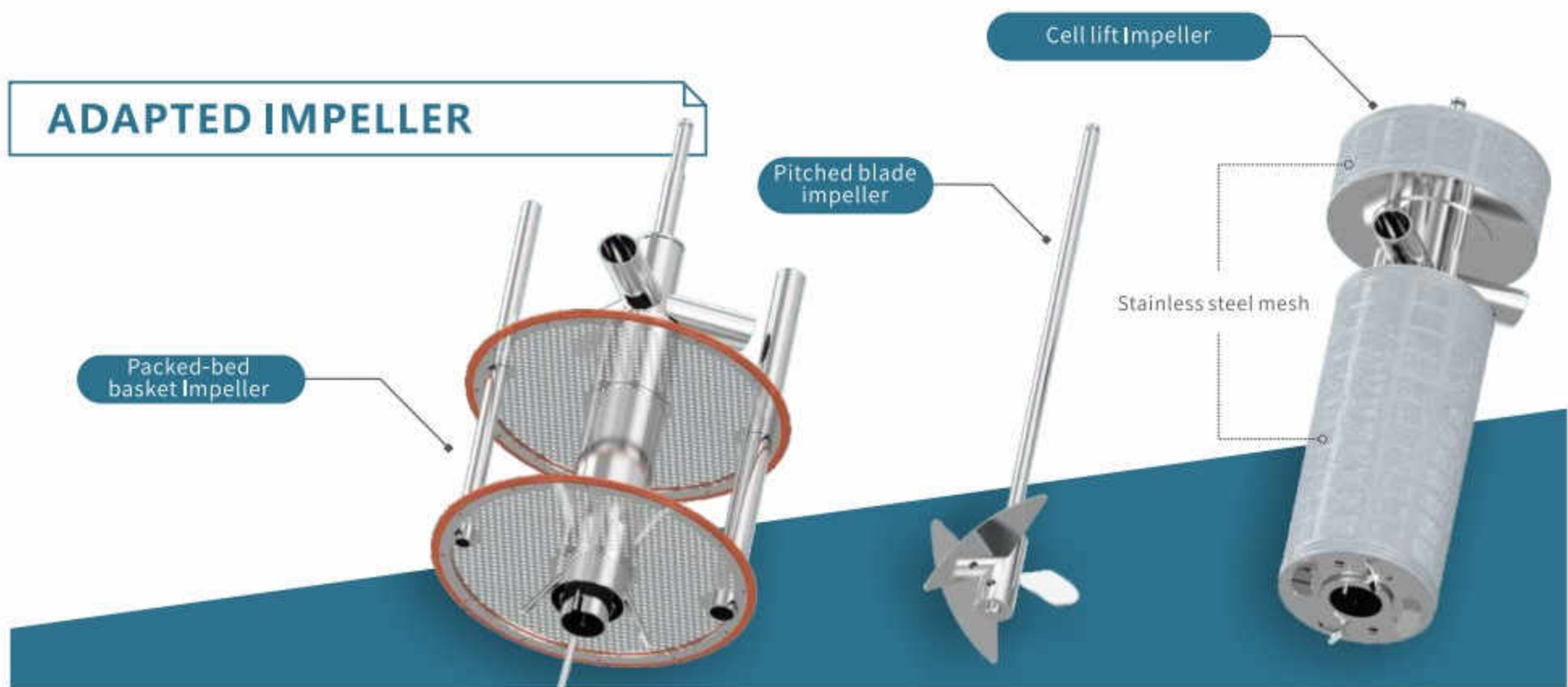
Audit tracking/statements/log records etc. and GMP standards



Trend

Including agitation/temperature/pH/DO/spurge flow/pumps. Data output





Packed-bed basket Impeller for fabric carrier cells

PROCESS CHARACTERISTICS

- Larger adhesion area and strong cell adhesion ability
- No contact aeration system, low (no) shear forces stirring system
- No need to pre-treat the fabric carrier, and fast adherent
- Unrestricted perfusion culture without interception device
- Low cell seeding density, 3D fabric carrier supports ultra-high cell density culture
- High viral titer, better for purification

PROCESS APPLICATION

- R&D and production for adherent CHO cells of EPO/TPO
- R&D production for human virus vaccines, e.g. COVID-19 vaccine/rabies vaccine/EV71 vaccine/IPV vaccine /influenza vaccine/vaccinia, etc.
- R&D and production for LV (lentivirus)/ ADV(adenovirus)/ AAV(adeno-associated virus)/ RV(retrovirus)/ HSV (oncolytic virus)/ poxvirus and other viral vectors of 293/ 293t culture
- R&D and production for influenza vaccine of MDCK
- R&D and production for veterinary virus vaccines, e.g. swine fever/PRRS/ swine diarrhea/ swine gastroenteritis/ avian influenza/ pseudorabies etc.
- R&D and production for cell exosomes
- High-density culture of hybridoma cells/stem cells etc.
- R&D and production for primary cells and virus vaccines, e.g. human rabies vaccines from chicken embryos, etc.

Cell lift Impeller for Micro-carrier cells

PROCESS CHARACTERISTICS

- Larger adhesion area and higher density
- Scale up and cultivated
- Observe and count easier for sampling
- No contact aeration system, low (no) shear forces stirring system
- Better for perfusion cell culture
- Trypsinization harvest or scale-up culture

PROCESS APPLICATION

- R&D and production of EV71 (Enterovirus 71) vaccine for VERO
- R&D and production of human rabies vaccine for VERO
- Culture for stem cells, e.g. IPS and MSC etc.
- R&D and production for human rabies vaccines of diploid cells

PRODUCT MODEL

Item	Model	Range of Application
SKC300 Bioreactor	SKC0301-4110	Applicable to SKC0300 series, 2.5L vessel kit
	SKC0301-4111	Applicable to SKC0300 series, 5.0L vessel kit
	SKC0301-4112	Applicable to SKC0300 series, 7.5L vessel kit
	SKC0301-4113	Applicable to SKC0300 series, 14.0L vessel kit

APPLICATION

- 01 Fabric carrier adherent cell culture, R&D and production of extracellular product
- 02 Suspended cell culture for suspended cell culture
- 03 Micro-carrier adherent cell culture for adherent cells
- 04 Batch and fed batch available



SPECIFICATION

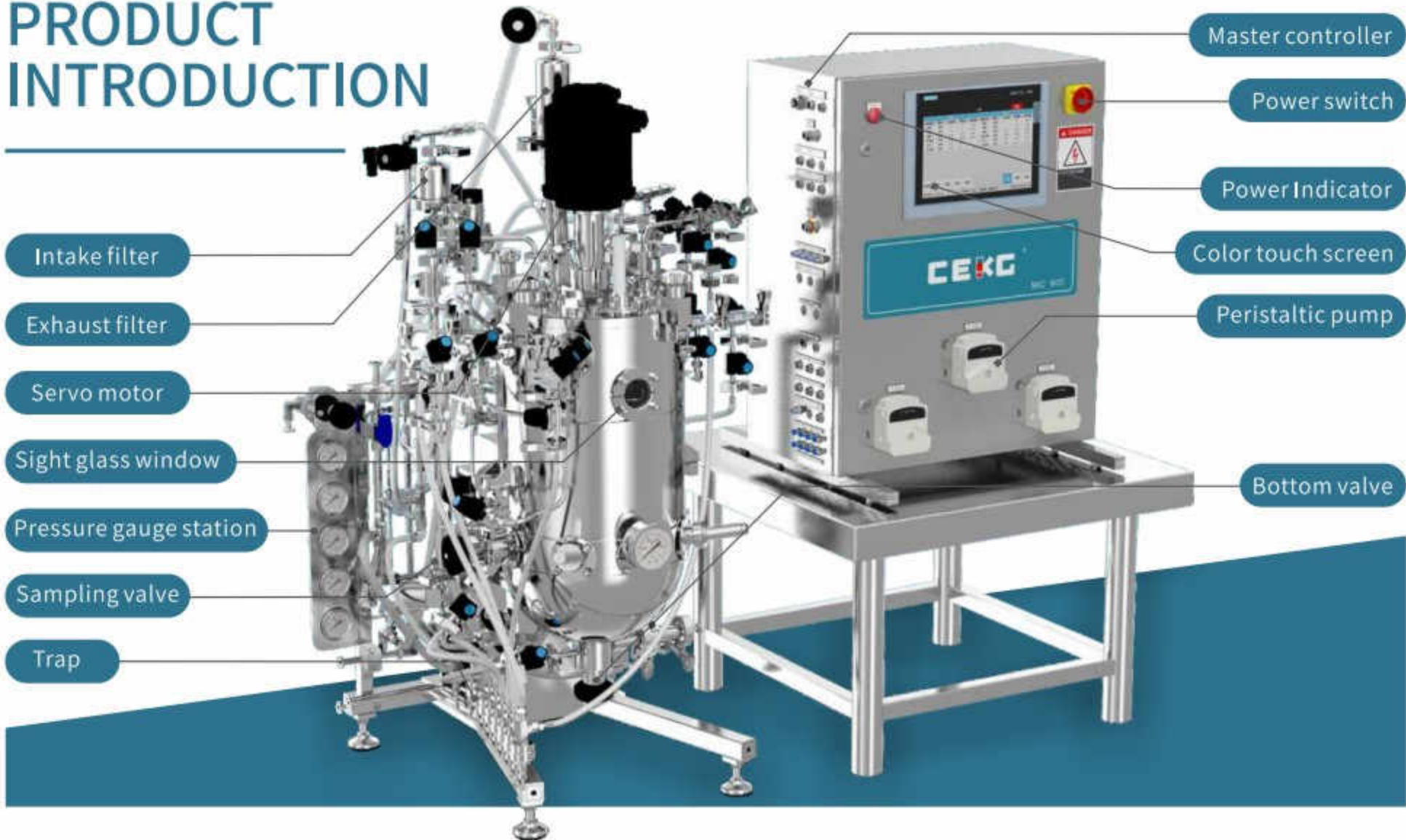
Vessel volume	Total volume	2.5L	5.0L	7.5L	14.0L
	Working volume	0.75L-1.75L	1.25-3.75L	2.0-5.5L	3.0L-10.5L
Headplate connector	Qty.*Size	1*6.35mm	3*6.35mm、1*19mm	3*6.35mm、1*19mm	3*6.35mm、1*19mm
		9*PG13.5	10*PG13.5	12*PG13.5	12*PG13.5
Control system	Hardware※	Siemens PLC, 12-inch Siemens touch screen, 4 pumps, Ethernet interface, USB interface, load cell optional			
Temperature control	Water jacket, heater PID automatic control, Pt100 sensor, accuracy $\pm 0.1^{\circ}\text{C}$, temperature control range 8-45 $^{\circ}\text{C}$ above coolant temperature, Max.60 $^{\circ}\text{C}$				
Agitating system	Agitating form	Upper agitating, magnetic-driven			
	Impeller※	Pitched-blade impeller/basket impeller/cell lift impeller/spin filter impeller optional			
	Agitating speed	Speed range:25-500RPM, accuracy: $\pm 1\text{RPM}$ (excluding 14.0L)		Speed range: 25-150RPM (14.0L)	
Exhaust	Condensate/filter	Stainless steel/0.2 μm air filter			
Gas※	Control system	1 or 4 thermal mass flow controllers optional			
Sparge ※	Circinate. Micro and macro sparge optional				
pH※	2-12, PID control cascaded with pumps/gas flow. ISM probe optional				
DO※	0-200%, PID control cascaded by agitation/pumps/gas flow. ISM probe/ optical probe optional				
Pumps※	Parameters	4 fixed-speed pumps for addition/acid/base/anti-foam etc., speed 25PRM, 25PRM /100PRM fixed-speed or variable-speed pumps optional.			
Utilities	Water/gas	Air/O ₂ /N ₂ /CO ₂ , 10PSIG			
Power supply	AC220V, 50/60Hz, 10A				

Note: ※Optional



PRODUCT INTRODUCTION

SKC800 BIOREACTOR



N/A connector



Sampling valve



Temperature validation

INTRODUCTION

A bioreactor that can automatically sterilize.

Adopts self-developed biological reaction process control algorithm. By stirring, temperature, pH, DO, sparger, overlay, peristaltic pump, anti-foam and liquid level, load cell, cold spot detection and additional analogy input and output to achieve batch/fed batch/continuous process.

Adopts brand components from domestic and abroad. The equipment has a neat appearance, easy to clean and sterilize, concise human-machine interface, stable process control and convenient operation.

A bioreactor that compatible with cell culture stirring Impeller and bioreactors, e.g. Suspension cell culture suits pitched blade impeller or spin filter type Impeller; Perfusion culture of fabric carrier adherent cells suits packed-bed basket Impeller; Micro-carrier cell perfusion culture suits cell lift Impeller.

HARDWARE

- 01 Well-known brand components, e.g. 4-valve/sampling valve/ bottom valve/mass flow controller, etc.
- 02 N/A connector and ferrule fitting
- 03 Cold point monitoring and F0 of sterilization to meet GMP standards
- 04 Multiple stirring blades available, e.g. batch cell culture/fed-batch cell culture/continuous perfusion culture/ cell suspension culture/high-density culture of micro-carriers and fabric carriers

HMI

- Siemens PLC: Running stability
- Siemens color touch screen: To record and save process data and human-machine interface simple
- Automatic in-situ sterilization control interface: One key controller after setting the sterilization time and temperature and others.
- Self-developed cell culture parameter control algorithm: Preset cell culture pH, DO, gassing (four gas mixture and gas flow), temperature and other control algorithms
- Multiple cascades: Customized, e.g. parameter cascade/time cascade/alarm correlation algorithms
- Industrial Ethernet: Control multiple devices remotely and portable devices optional
- Modular design: Flexible and easy to maintain.
- 3 level security, electronic signature, audit trail, batch report, log record and GMP standards



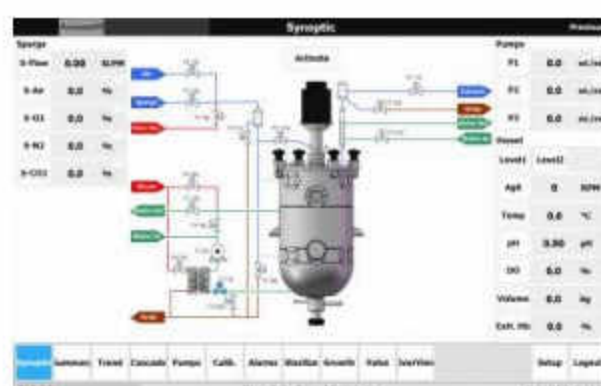
4 valve group



Cold spot monitoring



Packed-bed basket impeller with fabric carrier



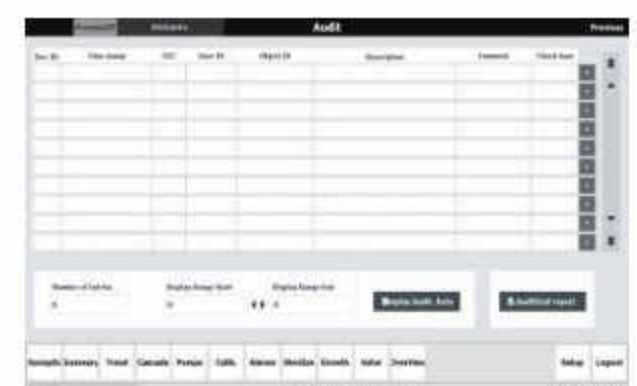
Flow chart

Simple process interface, including system activation/four-gas control/temperature/stirring/peristaltic pump/pH DO control, etc.



Automatic Sterilization Interface

Directly set, e.g. drain time/sterilization time/sterilization temperature/culture temperature etc., and the on-off status of control valve can be monitored



Audit

Audit trail, batch report, log record and GMP standards



Packed-bed basket impeller for fabric carrier cells

PROCESS CHARACTERISTICS

- Larger adhesion area and strong cell adhesion ability
- No contact aeration system, low (no) shear forces stirring system
- No need to pre-treat the fabric carrier, and fast adherent
- Unrestricted perfusion culture without interception device
- Low cell seeding density, 3D fabric carrier supports ultra-high cell density culture
- High viral titer, better for purification

PROCESS APPLICATION

- R&D and production for adherent CHO cells of EPO/TPO
- R&D and production for human virus vaccines, e.g. COVID-19 vaccine/rabies vaccine/EV71 vaccine /IPV vaccine /influenza vaccine/vaccinia, etc.
- R&D and production for LV (lentivirus)/ADV (adenovirus)/AAV(adeno-associated virus)/RV (retrovirus) /HSV (oncolytic virus) /poxvirus and other viral vectors of 293/293t cell
- R&D and production for influenza vaccine of MDCK
- R&D and production for veterinary virus vaccines, e.g. swine fever/PRRS/swine diarrhea /swine gastroenteritis/avian influenza/pseudorabies etc.
- R&D and production for cell exosomes
- High-density culture of hybridoma cells/ stem cells etc.
- R&D and production for primary cells and virus vaccines, e.g. human rabies vaccines from chicken embryos, etc.



Cell lift impeller for micro-carrier cells

PROCESS CHARACTERISTICS

- Larger adhesion area and higher density
- Scale up and cultivated
- Observe and count easier for sampling
- No contact aeration system, low (no) shear forces stirring system
- Better for perfusion culture
- Trypsinization harvest or scale-up culture

PROCESS APPLICATION

- R&D and production of EV71 (Enterovirus 71) vaccine for VERO
- R&D and production of human rabies vaccine for VERO
- Culture for stem cells, e.g. IPS and MSC etc.
- R&D and production for human rabies vaccines of diploid cells

Pitched blade impeller for suspension and low-density micro-carrier cells

PROCESS CHARACTERISTICS

- Easy to scale up for suspension and low-density micro-carrier cell culture
- Observe and count easier for sampling
- Flexible process for batch/fed-batch/continuous perfusion cell culture
- Tolerate shear force of stirring Impeller and influence of air bubbles
- Together with ATF/spin filter, etc. to achieve continuous perfusion cell culture

PROCESS APPLICATION

- Protein of CHO cell antibodies
- Suspended animal cells culture
- Human rabies vaccine of VERO cells



APPLICATION

- 01 For fabric carrier adherent culture, especially for secreted products, e.g. CHO for EPO/TPO, VERO cells for human rabies vaccine/Japanese encephalitis vaccine/COVID-19 vaccines/MDCK cells for flu vaccines, etc.
- 02 For micro-carrier adherent culture, e.g. VERO cells/diploid cells for human rabies vaccine, etc.
- 03 For suspension cell culture, e.g. CHO cell antibody/SF9 cell cervical cancer vaccine, etc.

SPECIFICATION

Vessel volume	Vessel volume	40L	75L	150L	300L
	Working volume	10.75L-32.0L	18.75-60.0L	37.5-120.0L	75.5L-240.0L
Control system	Siemens PLC, Siemens touch screen, 3 pumps, Ethernet interface, USB interface				
Temperature control	Water jacket, electrical-heater PID automatic control, Pt100 sensor, control accuracy $\pm 0.1^{\circ}\text{C}$, PID control, temperature control range 8-45 $^{\circ}\text{C}$ above, Max. 60 $^{\circ}\text{C}$				
Agitating system ※	Agitating form	Upper mixing, double seal			
	Impeller ※	Pitched-blade impeller/basket impeller/cell lift impeller/spin filter impeller optional			
	Agitating speed	25-200rpm	25-150rpm	25-120rpm	25-100rpm
Load cell	Load cell mould	0-40KG, cascaded by peristaltic pump optional	0-100KG, cascaded by peristaltic pump optional	0-200KG, cascaded by peristaltic pump optional	0-300KG, cascaded by peristaltic pump optional
Sparger ※	4 gas mixing, 1 or 4 thermal mass flow controllers optional				
Overlay ※	4 gas mixing, 1 or 4 thermal mass flow controllers optional				
Exhaust	Exhaust condenser, exhaust filter heater				
Gas distributor ※	Circinate. Micro and macro sparge optional				
pH ※	2-12, PID control cascaded by pumps/gas flow. ISM probe optional				
DO ※	0-200%, PID control, cascaded by agitation/pumps/gas flow. ISM probe/optical probe optional				
Sterilization	Automatic SIP				
Cold spot detection ※	Optional				
Pumps ※	Fixed-speed pumps for addition/acid/base/anti-foam etc., speed 100PRM,				
Level and anti-foam ※	1 level electrode. High level electrode optional				
SCADA software ※	Optional. GMP/GAMP standards.				
Utilities	Water: 50um filtration; industrial steam 30-35PSIG, pure steam 30-35PSIG; 4 gases 30-35PSIG				
Power supply	AC220V,50/60HZ,20A				

Note: ※ Optional



PRODUCT INTRODUCTION



Parallel Control Software

Parallel control and record 2 to 8 bioreactors parameter, 3 level security, audit trail, batch report, log record and GMP standards.

SKC700 BIOREACTOR

INTRODUCTION

A cost-effective culture system. It consists of a master controller and quality sterilization glass vessel.

By controlling the agitation/temperature/pH/ DO/sparger/pumps/ anti-foam and level probe to achieve plant and animal cell culture, microbial fermentation.

Adopts brand components from domestic and abroad. The equipment has a neat appearance, easy to clean and disinfect, concise human-machine interface, stable process control and convenient operation.

FEATURE

- Multiple water-jacketed vessel: 2.5L, 5.0L, 7.5L and 14.0L optional
- Multiple cascades: Customized parameter cascade/time cascade/alarm correlation algorithms
- Siemens PLC control system: For stirring speed/temperature/pH/DO gassing/anti-foam/ liquid level etc.
- A 7-inch color industrial-grade touch screen: To record and save process data
- Industrial Ethernet: Control and record 2 to 8 bioreactors remotely
- 3 level security, electronic signature, audit trail, batch report, log record and GMP standards
- Modular design: Flexible and easy to maintain
- Power-off self-recovery: Automatically recover the state before power -off



APPLICATION

- R&D and cultivation for antibody protein drugs
- R&D and cultivation for stem cells
- R&D and cultivation for human or veterinary vaccines
- R&D and cultivation for immune cells

CELL CULTURE BIOREACTOR CONFIGURATION



PRODUCT MODEL

Item	Model	Heating Type	Applicable Scope
SKC700 Bioreactor Fermenter	SKC0701-1401	Blanket	Applicable to SKC0700 series, 2.5L vessel kit. Magnetic drive
	SKC0701-1402	Blanket	Applicable to SKC0700 series, 5L vessel kit. Magnetic drive
	SKC0701-1405	Blanket	Applicable to SKC0700 series, 7.5L vessel kit. Magnetic drive
	SKC0701-1410	Blanket	Applicable to SKC0700 series, 14.0L vessel kit. Magnetic drive

SPECIFICATION

Note: ※Optional

Vessel volume	Vessel volume	2.5L	5.0L	7.5L	14.0L
	Working volume	0.75-1.75L	1.25-3.75L	2.0-5.5L	3.0-10.5L
	Fermenter type	Heating blanket single-wall, borosilicate glass			
Headplate connector	Qty.*Size	1*6.35mm 9*PG13.5mm	3*6.35mm 10*PG13.5mm 1*19mm	3*6.35mm 12*PG13.5mm 1*19mm	3*6.35mm 12*PG13.5mm 1*19mm
Control system	Hardware※	Siemens PLC, 7-inch color touch screen, 3 pre-pumps, Ethernet interface, USB interface, load cell optional			
Temperature control ※	Heating blanket temperature control, PID automatic control, Pt100 sensor, accuracy $\pm 0.1^{\circ}\text{C}$, temperature control range 8-45 $^{\circ}\text{C}$, Max.60 $^{\circ}\text{C}$				
Agitating system	Agitating form	Upper agitating, magnetic-driven			
	Impeller※	Pitched-blade impeller/basket impeller/cell lift impeller/spin filter impeller optional			
	Agitating speed	Speed range: 25-500RPM, accuracy: $\pm 1\text{RPM}$ (excluding 14.0L) Speed range: 25-150RPM (14.0L)			
Exhaust	Condensate/filter	Stainless steel/0.2 μm air filter			
Gas※	Control system ※	1 or 4 thermal mass flow controllers optional			
	Sparge ※	Circinate. Micro and macro sparge optional			
pH※	2-12, PID control cascaded by pumps/gas flow. ISM probe optional				
DO※	0-200%, PID control, cascaded by agitation/pumps/gas flow. ISM probe/optical probe optional				
Pumps※	3 fixed-speed pumps for addition/acid/base/anti-foam, etc., speed 25PRM, variable speed pumps optional				
Utilities	Water/gas	Air/O ₂ /N ₂ /CO ₂ , 10PSIG			
Power supply	AC220V, 50/60Hz, 10A				

APPLICATION

- Plasmids, human proteins, etc. in Escherichia coli
- Pichia pastoris to induce the production of microbial fermentation proteins, etc.
- Fermentation culture of streptomycin yeast/baculovirus
- Batch/fed perfusion culture of Escherichia coli, yeast or plant cells



MICROBIAL FERMENTOR CONFIGURATION



MICROBIAL FERMENTER MODEL

Item	Model	Heating Type	Applicable Scope
SKC700 Microbial Fermente	SKC0701-1151	Blanket	Applicable to SKC0700 series, 2.5L vessel kit. Direct drive
	SKC0701-1152	Blanket	Applicable to SKC0700 series, 5L vessel kit. Direct drive
	SKC0701-1155	Blanket	Applicable to SKC0700 series, 7.5L vessel kit. Direct drive
	SKC0701-1150	Blanket	Applicable to SKC0700 series, 14.0L vessel kit. Direct drive

SPECIFICATIONS

Note: ※ Optional

Vessel volume	Vessel volume	2.5L	5.0L	7.5L	14.0L
	Working volume	0.75-1.75L	1.25-3.75L	2.0-5.5L	3.0-10.5L
	Fermenter type	Heating blanket single-wall, borosilicate glass			
Headplate connector	Qty.*Size	1*6.35mm 9*PG13.5mm	3*6.35mm 10*PG13.5mm 1*19mm	3*6.35mm 12*PG13.5mm 1*19mm	3*6.35mm 12*PG13.5mm 1*19mm
Control system	Hardware※	Siemens PLC, 7-inch color touch screen, 3 pre-pumps, Ethernet interface, USB interface, load cell optional			
Temperature control ※	Heating blanket temperature control, PID automatic control, Pt100 sensor, accuracy ±0.1°C, temperature control range 8-45°C, Max.60°C				
Agitating system	Agitating form	Upper agitating, magnetic- driven			
	Impeller※	Rushton blade			
	Agitating speed	Speed range: 25-1200RPM, accuracy: +1R PM			
Exhaust	Condensate/filter	Stainless steel/0.2µm air filter			
Gas※	Control system ※	1 or 4 thermal mass flow controllers optional			
	Sparge ※	Circinate. Micro and macro sparge optional			
pH※	2-12, PID control cascaded by pumps/gas flow. ISM probe optional				
DO※	0-200%, PID control, cascaded by agitation/pumps/gas flow. ISM probe/optical probe optional				
Pumps※	3 fixed-speed pumps for addition/acid/base/anti-foam,etc., speed 25PRM, 25PRM variable-speed pumps optional				
Utilities	Water/gas	Air/O2/N2/CO2, 10PSIG			
Power supply	AC220V, 50/60Hz, 10A				

SERVICES

Wuhan CEKG Technology CO., LTD. provides customers with best on-site services based on its service mission.

SERVICES

Wuhan CEKG Technology Co., Ltd. has own cell culture laboratory and technical support team, which can provide cell culture technical services, e.g. process scale-up and validation, process scale-up, process optimization, etc., and can provide a whole cell culture solutions.



SERVICES

Wuhan CEKG Technology Co., Ltd. provides installation and test, technical consultation, maintenance, and IQ/OQ/PQ validation services for different bioreactors and liquid distribution and storage systems.

Single-use product validation services

- Chemical compatibility
- Extractables
- Leachable
- Adsorption



SERVICES

Wuhan CEKG Technology Co., Ltd. has various spare parts with bioreactors and consumables with liquid mixing/storage system.

Spare parts: Peristaltic pumps/solenoid valves/diaphragm valves/water pumps/mass flow controllers/Siemens PLC module/pH or DO probes/DO probe membranes or electrolytes/glass joints/single-wall or double-wall glass vessels/sampling kits/O-rings/gaskets/diaphragms/various Impeller kits/316L meshes, etc.

Consumables: CPC quick connectors/CPC aseptic connectors/T-shape or Y-shape or 4 ways connectors/reducing T connectors/straight connectors/silicone tubing/C-flex tubing/single-use addition bottle/silicone tubing clamp, etc.



△ 316L mesh



△ Peristaltic pump



△ O-rings, gasket, diaphragm



△ Circulating water pump



△ pH and DO probes



△ Connector accessories



△ CPC connectors



△ Silicone tubing and C-flex tubing



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