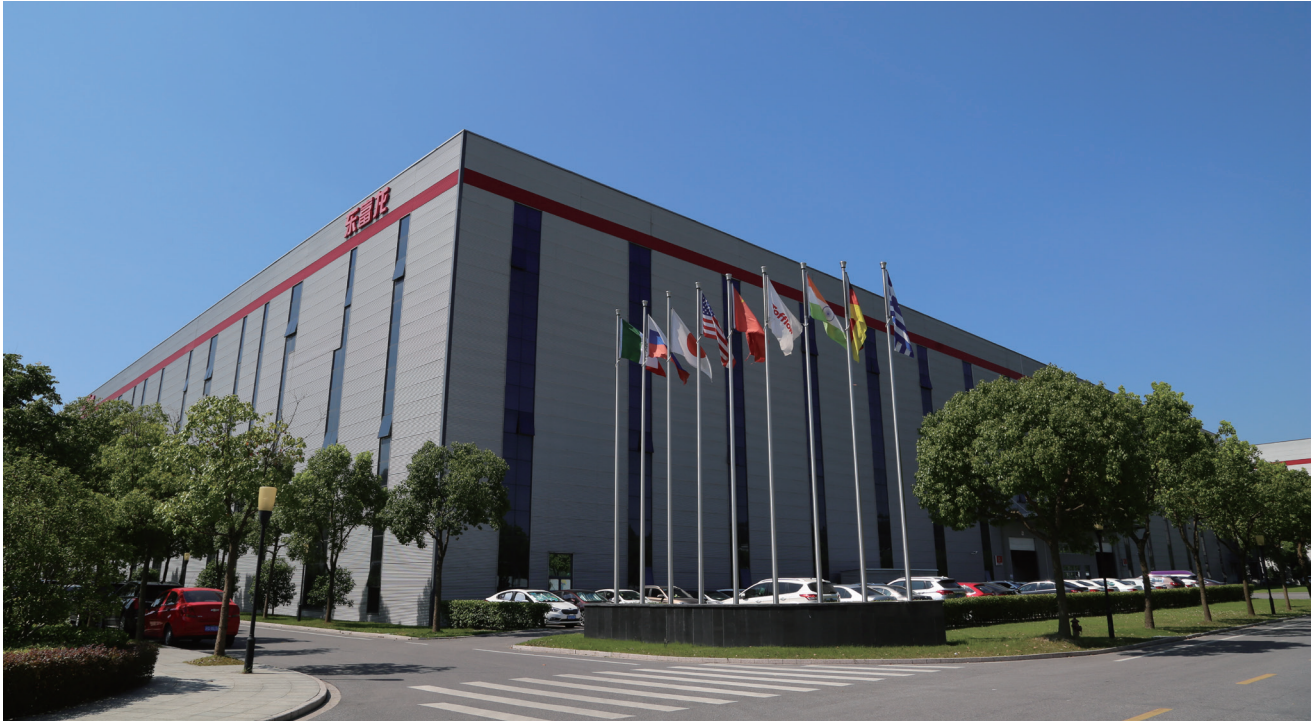


**Tofflon**



**Glass Bioreactor**

# Tofflon Life Science Co.,Ltd.



**F**ounded in 1993, Tofflon Science and Technology Group Co., Ltd. (SZ:300171) is a pioneering Chinese enterprise in the field of biotechnology, with a rich history of 30 years. With annual sales reaching 5.4 billion RMB in 2022 and a global workforce of 5,500 employees, Tofflon has established over 50 offices worldwide, embodying a globalized business and team.

Tofflon Life Sciences Co., Ltd., the flagship subsidiary within the group, plays a pivotal role in their portfolio. It focuses on the research and development of cutting-edge technologies in the biopharmaceutical and life science industries. As a strategic division Tofflon life science provides one-stop solutions and services that integrate bioprocessing equipment, core consumables like sterile bags, culture media, resins to further enquire and professionally.

- In the realm of cell therapy, we offer complete solutions for the preparation and production of immune cell pipelines, stem cell pipelines, tumor cell vaccines, and more.
- For gene therapy, we provide overall solutions for the research, development, and industrialization of nucleic acid drugs (mRNA/DNA) and viral vector drugs.
- In the field of biological sample banking, we conduct research and development of automatic sample storage management systems to provide comprehensive solutions for cell seed and tissue samples.
- In the consumables sector, we have developed a complete range of products including disposable bags (culture bags, mixing bags, storage bags), bio-reagents (culture media, cryoprotectants, Ficoll, growth factors), resin (GFC, AC, AEX, CEX, HIC, MMC), filtration (microfiltration, deep filtration, TFF, cassette), and hard packaging materials.
- We also focus on disinfection, offering comprehensive solutions for clean room disinfection, surface and external disinfection, infection control, terminal disinfection, and multi-drug resistant microorganism disinfection, ensuring effective environmental disinfection.

Leveraging Tofflon Group's extensive expertise in design, manufacturing, engineering construction, and after-sales service worldwide, Tofflon Life Sciences Division is committed to serving the biopharmaceutical industry with enhanced speed and professionalism.

# Glass Bioreactor

Glass bioreactors (BRG) are widely used in microbial fermentation and cell cultivation, including microbial bioreactor, cell bioreactor, microcarrier bioreactor and fixed-bed bioreactor. The BRG series have different choices and customized functions to meet the requirements of R&D process development and marketed production. Meanwhile, the application of BRG have advantages on customized modifications and enlargements when combined with the experimental design, process research, reducing the R&D period.

## ■ Technical parameters of BRG

- ✔ Data management: equipped with desktop central server.
- ✔ pH electrode: test range: 0~14, control accuracy:  $\pm 0.1$ .
- ✔ DO electrode: test range: 0%~100% control accuracy:  $\pm 5\%$ .
- ✔ Temperature electrode: control accuracy  $\pm 0.1^{\circ}\text{C}$ .
- ✔ Bioreactor: borosilicate material and other sanitary materials.



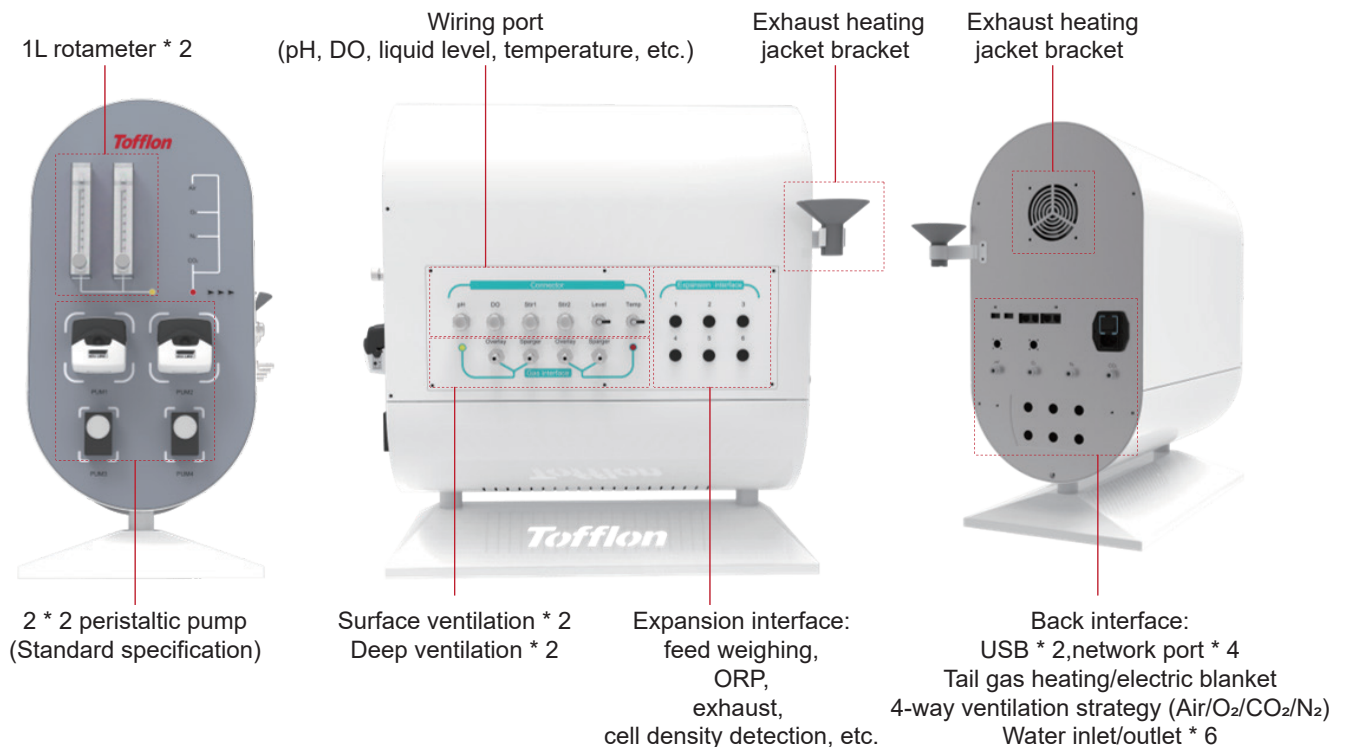
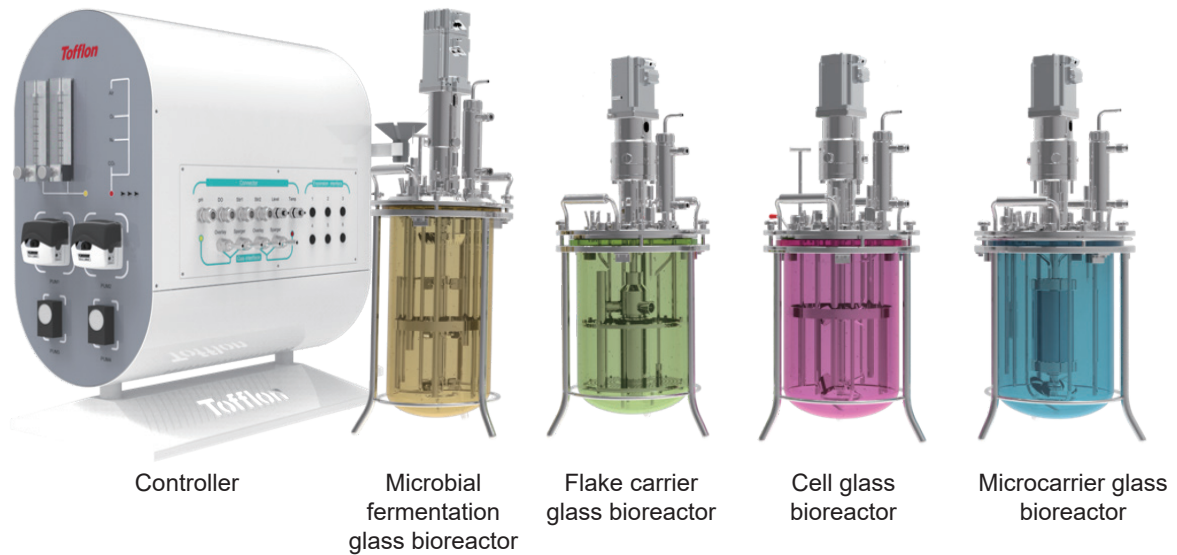
## ■ Advantages of BPG bioreactor

- ✔ **Reliability** --- uses magnetic coupling mixing system, no mechanical seal, not easy to leak, the overall sanitary design without dead angle ensures sterility.
- ✔ **Selectivity** --- different mixing systems and agitators suitable for the relevant culture environment can be selected according to the customer's process. Besides the magnetic coupling mixing system, mechanical mixing system can also be provided.
- ✔ **Ease of use** --- the operation mode of turning "complexity" into "simplicity", taking "highly automated system concept" as the core, the system will automatically compensate or optimize parameters according to the parameters set by customers.
- ✔ **Extensibility** --- easy to expand, including OD electrode, ORP electrode, methanol electrode, online detection of tail gas, tank weighing, feeding weighing, multiple feeding, etc.
- ✔ **Intelligence** --- compliant with relevant requirements and standards of GMP and FDA, precise control and data tracking of key cultivation parameters are carried out. At the same time, the upper computer can synchronously control up to 36 single bioreactors, and can synchronously control up to 36 single reactors with the company's EMS machine, and can interface with the company's EMS management system.

## ■ Applications of BRG bioreactor

- ✓ Research and development of cell, microorganism and photosynthetic bacteria culture application.
- ✓ Culture of mammalian, insect and human cell lines.
- ✓ Laboratory scale aerobic and anaerobic bacteria, yeast and fungal fermentation.
- ✓ Special applications: stem cell culture, biofuels and process research of biological polymers.

## ■ BRG bioreactor system

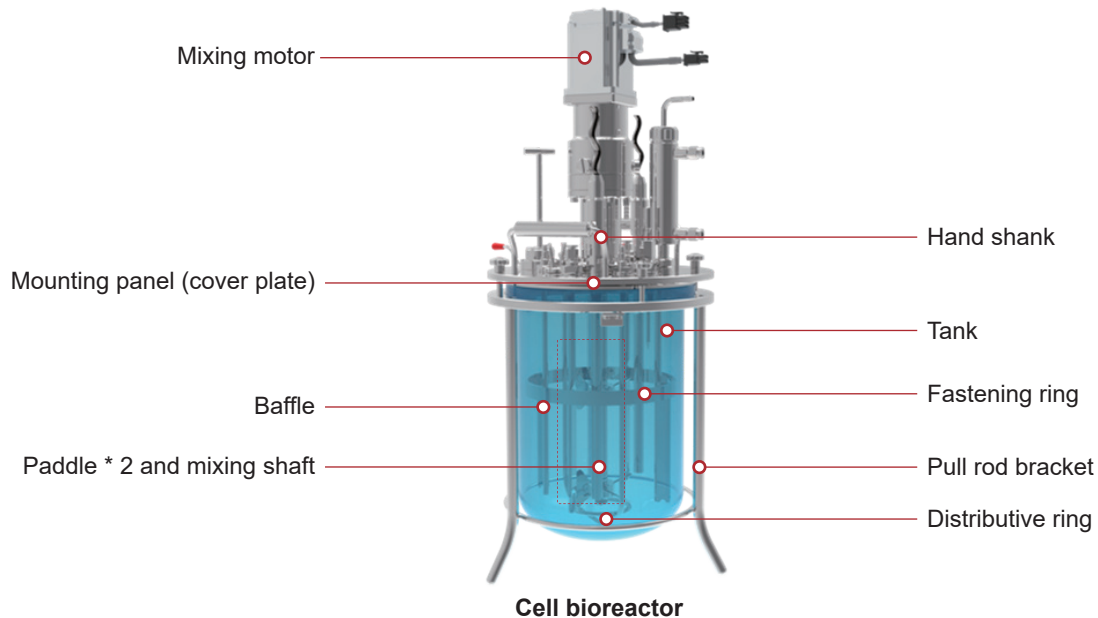


# BRG-Cell Glass Bioreactor

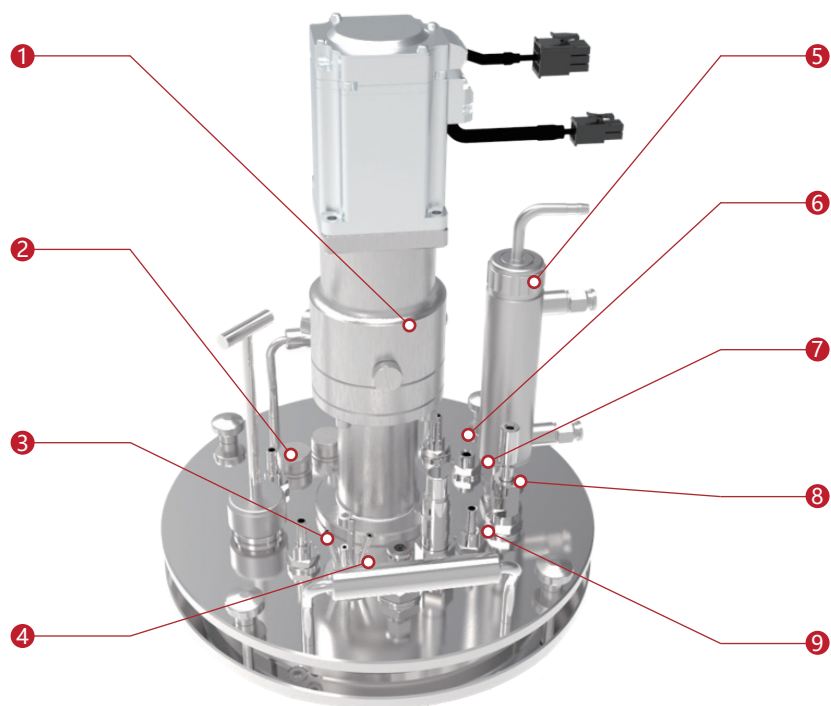
## Material description

- ✓ High borosilicate High physical strength, non-toxic, mechanical property, high thermal stability, strong acid and alkali resistance.
- ✓ SUS316L High corrosion resistance to reducing salts, various inorganic acids and organic acids, alkalis and salts.
- ✓ PTFE Acid and alkali resistance, resistance to various organic solvents, high temperature resistance.

## BRG - Cell Glass Bioreactor



## ■ BRG - List of components of cell glass bioreactor



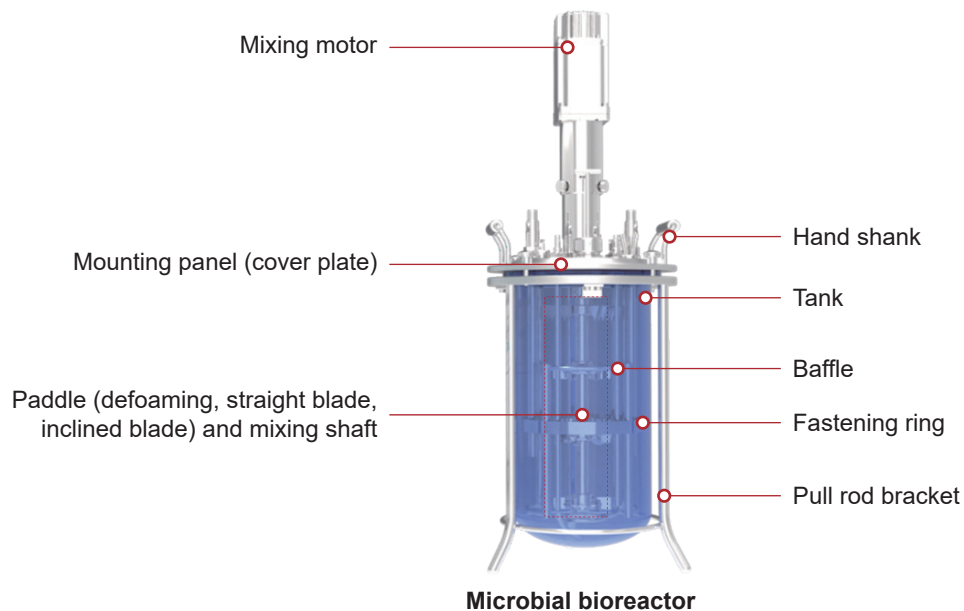
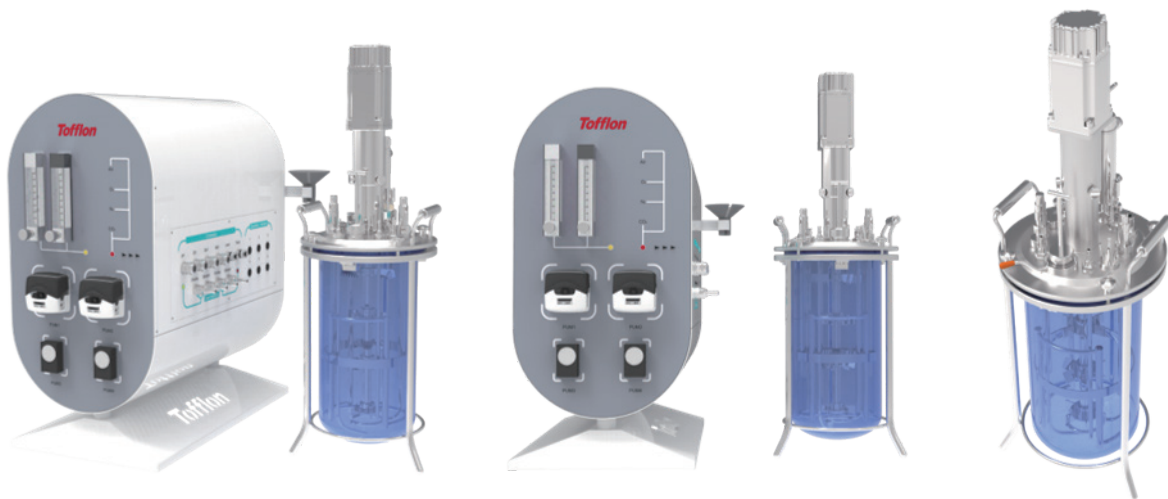
NO.	Component	Description
1	Mixing system	0-300rpm top magnetic stirring; Controllable accuracy $\pm 1$ rpm Low-shear propelling agitator * 2
2	Harvest tube	Automatic harvest can be set
3	Sampling tube	Manual sterile sampling with single-use syringe
4	Feeding port	Feeding rate: 0.2mL-290mL/min, Control accuracy: $\pm 0.02$ mL
5	Condenser	The chilled water or cooling water enters the condenser jacket, Optional chiller
6	Surface intake gas tube	Purified compressed air is supplied, and the ventilation capacity is 100% of the tank's full volume
7	Temperature electrode	PT100 platinum electrode, 10~55 °C ( $\pm 0.2$ °C) Theoretical accuracy: $\pm 0.1$ °C
8	Defoaming electrode	Insert a variable-length defoaming needle for defoaming
9	Intake gas tube	It can supply O <sub>2</sub> , CO <sub>2</sub> , N <sub>2</sub> , Air, four-way gas. The ventilation volume of O <sub>2</sub> , CO <sub>2</sub> and N <sub>2</sub> is respectively 20% of the total volume of the tank, and the ventilation volume of Air is 100% of the total volume of the tank

# BRG-Microbial Fermentation Glass Bioreactor

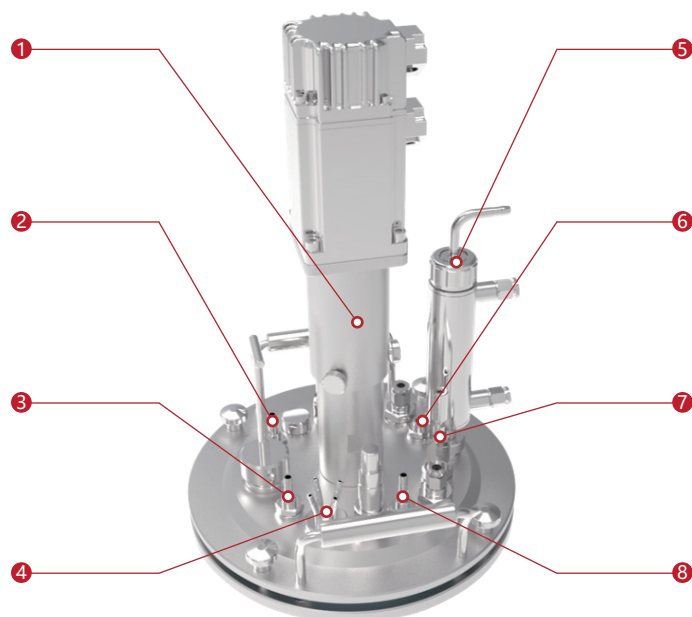
## Material description

- ✓ High borosilicate High physical strength, non-toxic, mechanical property, high thermal stability, strong acid and alkali resistance.
- ✓ SUS316L High corrosion resistance to reducing salts, various inorganic acids and organic acids, alkalis and salts.
- ✓ PTFE Acid and alkali resistance, resistance to various organic solvents, high temperature resistance.

## BRG - Microbial Fermentation Glass Bioreactor



## BRG - List of microbial fermentation glass bioreactor



NO.	Component	Description
1	Mixing system	0-1200rpm upper machinery, controllable accuracy $\pm 1$ rpm Rushton paddle * 2, inclined blade agitator paddle * 1, defoaming paddle * 1 A315 agitator, CD-6 agitator, BT-6 agitator and various customized agitators are optional
2	Harvest tube	Automatic harvest can be set
3	Sampling tube	Manual sterile sampling with single-use syringe
4	Feeding port	Feeding rate: 0.2ml-510mL/min, Control accuracy: $\pm 0.02$ mL
5	Condenser	The chilled water or cooling water enters the condenser jacket, Optional chiller
6	Surface intake gas tube	Purified compressed air is supplied, and the ventilation capacity is 100% of the tank's full volume
7	Temperature electrode	PT100 platinum electrode, 10~55°C ( $\pm 0.2^\circ\text{C}$ ) Theoretical accuracy: $\pm 0.1^\circ\text{C}$
8	Defoaming electrode	Insert a variable-length defoaming needle for defoaming
9	Intake gas tube	It can supply O <sub>2</sub> , CO <sub>2</sub> , N <sub>2</sub> , Air, four-way gas, The ventilation volume of O <sub>2</sub> , CO <sub>2</sub> and N <sub>2</sub> is respectively 20% of the total volume of the tank, and the ventilation volume of Air is 100% of the total volume of the tank

Product Name	0.5L	1L	2L	3L	5L	7L	10L	15L	20L
Cell glass bioreactor	●	●	●	●	●	●	●	●	●
Microbial fermentation glass bioreactor	●	●	●	●	●	●	●	●	●
Microcarrier glass bioreactor			●	●	●	●	●	●	●
Flake carrier glass bioreactor				●	●	●	●	●	●

Note: One can control one, one can control two, and 36 groups of single bioreactors can be controlled by the same upper computer for selection.





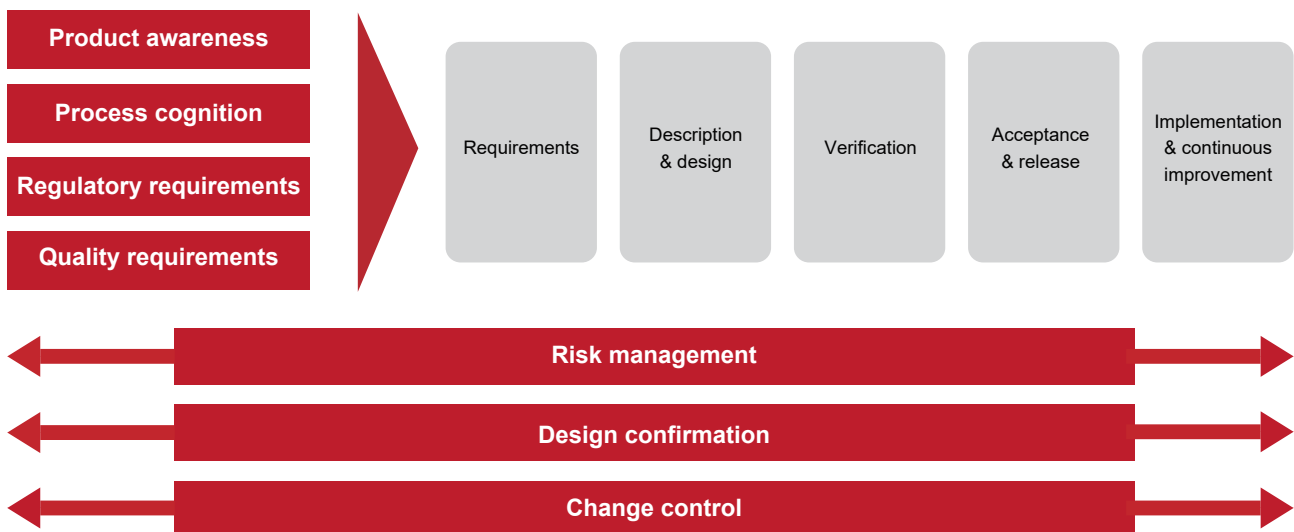
## Project Management

Three main factors determine the success of the project. Our organizational mode has been making constant update and improvement to enable you to fully achieve these goals. Through cooperation with us, you can minimize the direct resources required to manage the selection, purchase, installation, startup and verification of new production equipment.



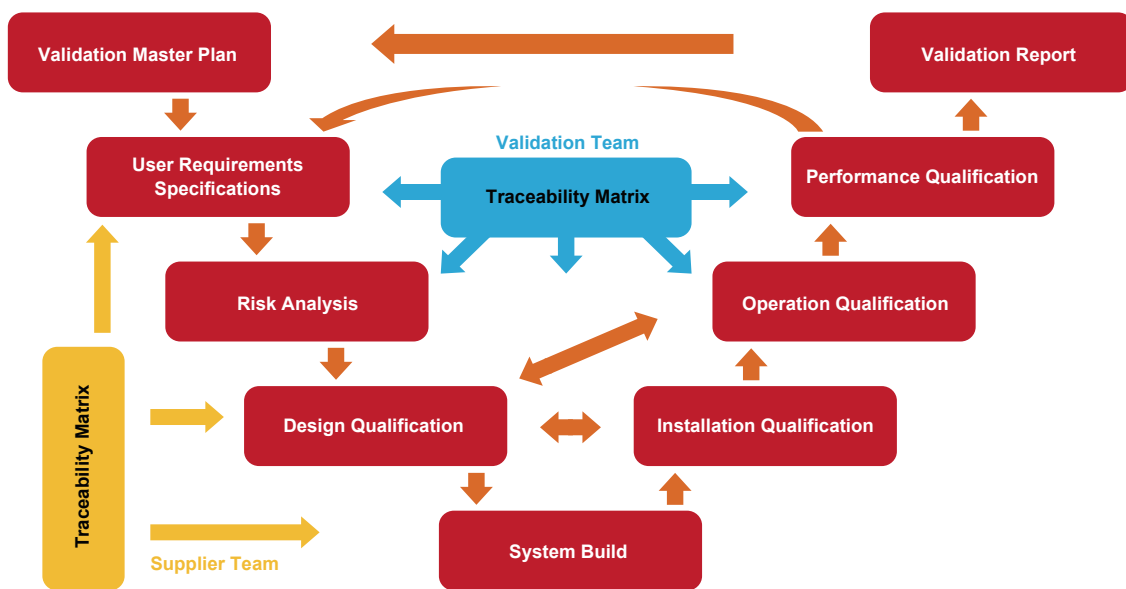
- ✔ Reliable quality
- ✔ Short cycle
- ✔ Focus on cost

## Good Engineering Practice - GEP



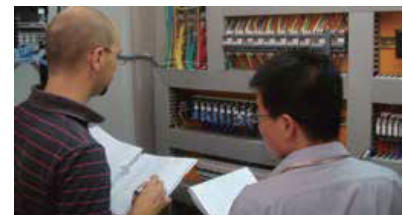


## Validation Support



## Verification Document System

- ✔ Complete document system
- ✔ Strict quality guarantee process
- ✔ Comply with cGMP confirmation scheme
- ✔ Ensure the stability and reliability of product quality





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