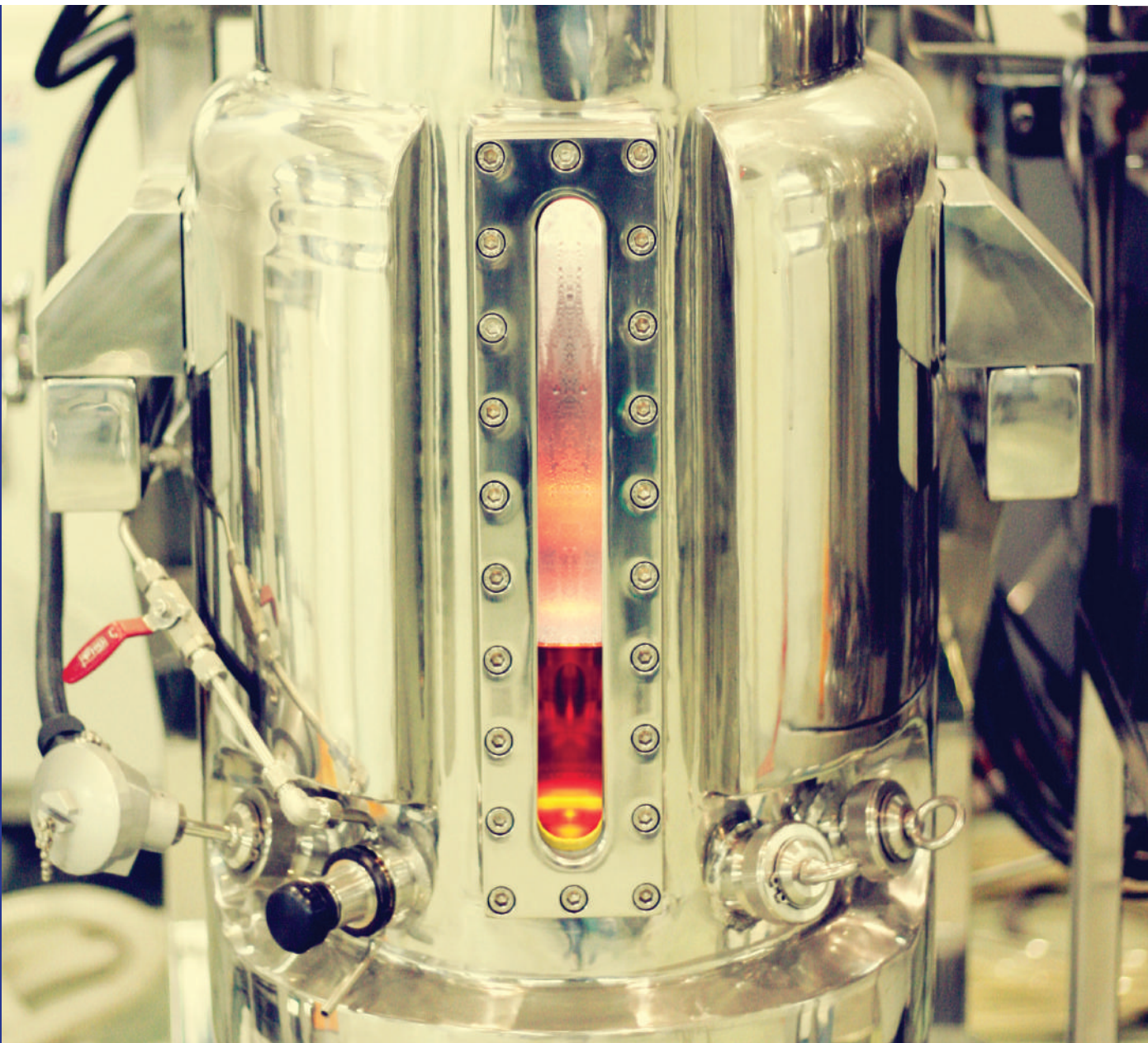


Fermenter System
Bioreactor
Lab / Pilot / Industrial Fermenter
Automation Fermenter System





About us

CNS Co., Ltd. has reached exclusive position in fermenter development, design, and manufacturing area. Also, our company has built customer satisfaction through unremitting efforts. We are reaching to the world's best bio-equipment field with the basis of technical excellence.

CEO Messege

Biotechnology business is proven appropriate and long-term solution to global warming and environmental issue. It also has become a core business which will lead the future economy in domestic and overseas.

Bio-engineering is the most important and necessary technology which will support biotechnology, however, CNS Co., Ltd. has been leading bio-crossing equipment industry by achieving ongoing technical development of upstream and downstream technology such as fermenter, bioreactor, and simulated moving bed.

CNS Co., Ltd. is a leader company leading equipment industry in the future of the biotechnology industry. We will do our best to meet the needs of our customers by performing continuous technological research and development and we will make an effort until everyone says "Yes."

CEO Im Jisoon

Lab Scale Fermenter



Features & benefits

- HMI and PLC interlocked to control automation system
- Application of login method of the driver for enhanced security
- Real-time trend analysis
- System management by remote control
- Dual instrument, pH/DO simulator
- Self-control of agitation in terms of DO value
- Bowl shaped vessel base is installed to minimize heat loss (Fine temperature control)
- Heated water circulation system to minimize media modification
- Continuous culture when returning after momentary power loss
- Variable factors can be added for different user need



Available options

- Double jacket type vessel
- Anaerobic bioreactor
- Continuous stirred tank reactor
- Air-lift loop bioreactor
- Photobioreactor

Specification

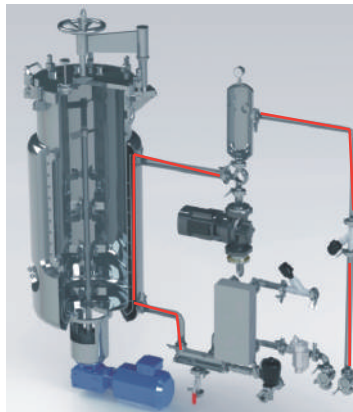
Vessel volume (L)	1	2.5	5	7.5	10
Working volume (L)	0.3 - 0.7	0.75 - 1.75	1.25 - 3.75	2.0 - 5.5	2.5 - 7
Adjustable port	pH, DO, Thermo well, Foam probe, Inoculation, Sampling, Feeding, Exhaust, Additional port				
Agitation	Two six-bladed Rushton impellers, Other options available				
Speed (RPM)	80 - 1,200 via PID control				
Air line	Ring sparger connected with 0.2µm disposable filter				
Exhaust line	316L stainless steel condenser mounted on the head plate				
Temperature	From 5°C above coolant temperature to 90°C via PID control				
Sensor	pH (0 - 14) / DO (0 - 100%) kit, Retractable probe housing				
Controller	HMI-PLC, Touch screen operator				

Pilot Scale Fermentation System

Features & benefits

- HMI and PLC are interlocked to control automation system
- Remote monitoring system installed to control real-time fermentation status anywhere at anytime
- Real-time database management features via iPad or Android
- User Log-in security
- Application of CE certified diaphragm valves to minimize contamination
- Indirect sterilization (Direct sterilization also available)
- Voice/text message and e-mail alert are available at emergency

Indirect sterilization process



- Installation of temperature control jacket on the surface of the reactor chamber that has medium and microorganisms
- Temperature control device supplies cooling water and steam via inlet/outlet passage formed in the temperature control jacket
- Maintenance of optimum culture condition of microorganisms by deformation of the nutrient medium

Chiller → Jacket → Circulation pump → Heat transfer
 → Jacket → Sterilization → Cooling



Specification

Vessel volume (L)	30	50	200	300	500
Working volume (L)	20	35	140	210	350
Construction	Material : STS316L, Aspect ratio 2.2 : 1				
Agitation	Top/bottom drive, Double mechanical seal, 3 Rushton impeller, 4 baffles				
Speed (RPM)	80 - 1,200 via PID control				
Air line	Ring sparger connected with 0.2µm disposable filter				
Exhaust line	316L stainless steel condenser mounted on the head plate				
Temperature	From 5°C above coolant temperature to 90°C via PID control				
Sensor	pH (0 - 14) / DO (0 - 100%) kit, Retractable probe housing				
Controller	HMI-PLC, Touch screen operator				

Plant Scale Fermentation System



Features & benefits

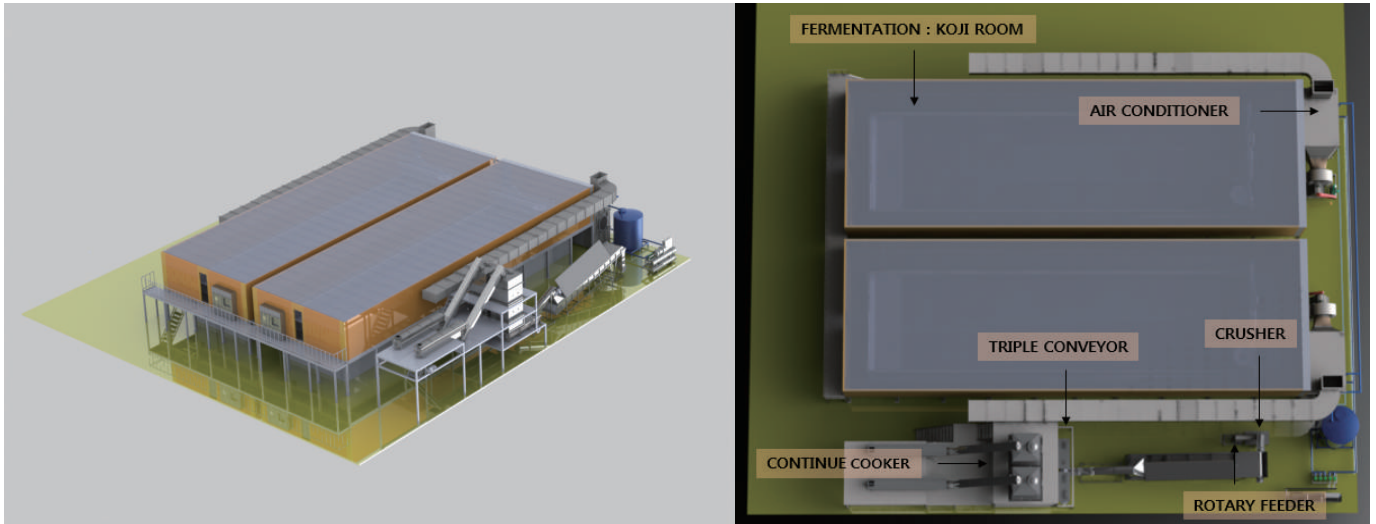
- HMI and PLC are interlocked to control automation system
- Remote monitoring system installed to control real-time fermentation status anywhere at anytime
- Real-time database management features via ipad or android
- User Log-in security
- Application of CE certified diaphragm valves to minimize contamination
- Indirect sterilization (Direct sterilization also available)
- Voice/text message and e-mail alert are available at emergency



Specification

Vessel volume (L)	1,000	2,000	5,000	10,000 ~ 100,000
Working volume (L)	700	1,400	3,500	7,000 ~ 70,000
Construction	Material : STS316L Aspect ratio 2.2 : 1			
Agitation	Top/bottom drive, Double, mechanical seal, 3 Rushton impeller, 4 baffles			
Speed (RPM)	60 ~ 250	50 ~ 220	50 ~ 450	50 ~ 400
Air line	SIP inlet filter, Mass flow controller			
Exhaust line	316L stainless steel condenser, Automatic backpressure control			
Temperature	Standard automatic sterilization, Indirect sterilization by hot water circulation			
Sensor	pH (0 - 14) / DO (0 - 100%) kit, Retractable probe housing			
Controller	HMI-PLC, Touch screen operator			
Additional options	CIP interface, Marine and pitched-blade impellers, Aspect ratio 2.2 : 1, Validation packages			

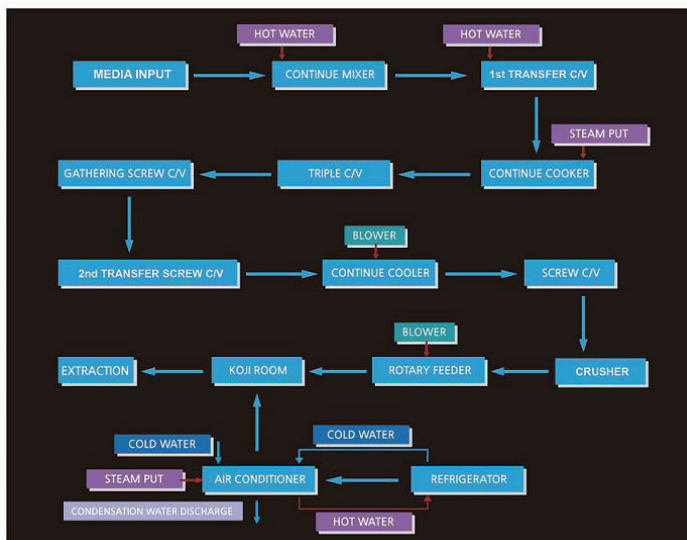
Solid-state Fermentation System



Solid-state fermentation uses soybean as a source of protein. Micro-organism is spread over the pre-steamed soybean for its maximum reproduction and growth. This system is designed to provide optimum growth environment to the micro-organism by supplying constant temperature and humidity control.

Features & Benefits

- Patented seed germ inoculation device
- Temperature and humidity controlled culture
- More than two different types of microbial culture simultaneously
- Uniform culture that is independent of season
- Compact system design to minimize a dead volume
- Automation system for the entire process

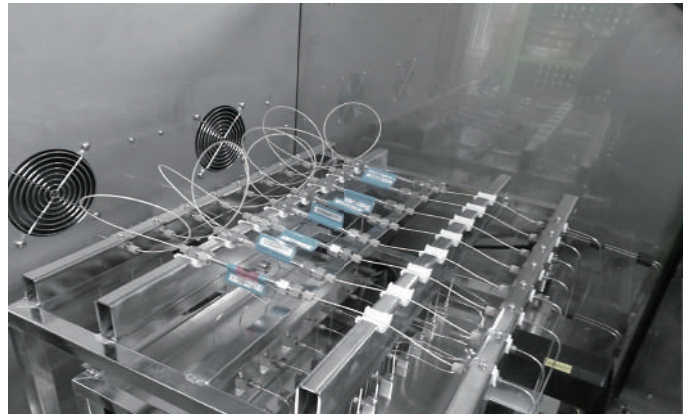


Simulated Moving Bed



In conventional batch chromatography, a single column is used for adsorptive separation. However, the batch chromatography is inefficient to obtain a high purity and high yield. For complete separation, it involves the consumption of a large amount of solvent.

Simulated Moving Bed (SMB) technology overcomes the limitations of batch chromatography and provides high productivity through overloaded operating condition. Moreover, it reduces solvent consumption and product dilution and this leads to an easier and cheaper product recovery step.



Advantages of SMB technology compared to classical batch chromatography

- The entire stationary phase is continuously covered with the mixture to be separated and produces much higher productivity
- 90% reduction in the demand for solvent due to solvent recycling
- Extract and raffinate are extracted in high concentration which makes it easier to remove solvent
- The patented multi-function valve enables compact size equipment

Application

- Petrochemical industry
- Sugar industry
- Chiral separation
- Pharmaceutical production
- Other industries



A row of industrial bioreactors, likely for fermentation or cell culture, arranged in a laboratory or factory setting. The equipment consists of tall, cylindrical stainless steel vessels with various pipes, valves, and sensors. A digital control panel is visible on one of the units. The background is slightly blurred, emphasizing the machinery.

www.biocns.com

CNS Co., Ltd. *Bio Control and System*

Sales and Service contact

3 Dong, 178 Daehwa Ro, Daeduk Gu
Daejeon, 306-801 Republic of Korea

Phone +82 70-4185-1454

Fax +82 42-633-8056

Research and Development

302, 16 Dong, 160 Daehwa Ro, Daeduk Gu
Daejeon, 306-801 Republic of Korea

Phone +82 42-670-8054

Fax +82 42-670-8056