

solid state fermentation bioreactor with stirring function

Solid state fermentation bioreactor is a kind of biological reaction equipment specialized in solid fermentation process, suitable for cultivating fungi, actinomycetes, yeasts and other microorganisms.

Solid State Fermentation Bioreactor (5L–50,000L Customizable)

The solid state fermentation bioreactor offers a high-clean, GMP-compliant system for solid substrate fermentation, supporting volumes from 5L to 50,000L. Made of 316L pharmaceutical-grade stainless steel, it is ideal for enzyme, antibiotic, pigment, organic acid, bio-feed, and environmental applications.

Main Features

1. **Customizable Volume:** 5–50,000L, tailored for research, pilot, or industrial production.
2. **316L Stainless Steel Tanks:** Horizontal/vertical, mirror-polished, GMP hygiene compliant.
3. **External SUS304 Jacket:** Attractive and highly efficient heat transfer.
4. **Comprehensive Monitoring Interfaces:** Sight glass, lamp, sampling port, safety/inoculation/condensation ports, valve, for easy maintenance and observation.



5. **Online High-Temp Sterilization:** Continuous stirring during sterilization for uniform heating and safety.
6. **Professional Stirring System:** AC motor/reducer, slant groove blade paddles, 0–60rpm adjustable, online speed detection, intermittent programmable mixing mode.
7. **Precise Environmental Control:** PID-controlled temp ($\pm 0.2^{\circ}\text{C}$, jacketed electric heating/cooling), humidity range 30–100% via water spray, bottom sterile air intake (0.01 μm filtration), multi-point pressure monitoring and filter-protected exhaust.
8. **Automation & Modularity:** Real-time adjustment of key parameters (temp, humidity, stirring, aeration), Pt100 sensors, automatic water replenishment, modular design for remote monitoring/data integration.

Working Principle

1. Closed system simulates natural solid substrate growth: controlled temp, humidity, oxygen, mixing.
2. **Loading & Sterilization:** Substrate loaded and sterilized in-tank via high-temp water bath or steam.
3. **Inoculation:** Strains introduced aseptically after sterilization/cooling.
4. **Environment Control:** PID temp/heating/cooling, sensor-driven humidity/water spray, intermittent mixing, sterile aeration from tank bottom.
5. **Pressure/Exhaust:** Manual valve regulates pressure, exhaust filtered to prevent pollution and blockage.
6. **Sampling/Monitoring:** Sampling port and sight glass for real-time status and sample extraction.

Typical Application Areas

1. **Microbial Preparation:** Biocontrol, phosphorus solubilizing, nitrogen-fixing bacteria for green agriculture.
2. **Food & Feed Additives:** Aflatoxin, yeast polysaccharide, compound enzymes, fermented soybean meal, improved yield/stability.
3. **Biomedical:** Antibiotics (penicillin, streptomycin, erythromycin), high-value natural products.
4. **Industrial Enzymes:** Cellulase, amylase, protease production under high-viscosity conditions.
5. **Environmental Protection:** Waste/wastewater degradation, composting, resource reuse (bran, wood chips, straw, etc.).