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COMPLETE  
**BIOPROCESS  
 ENGINEERING**  
 SOLUTIONS



## LEADING THE WAY IN BIOPROCESS ENGINEERING

Biozeen is a global, integrated biotech solutions provider, established by veteran industry professionals. Combining experience in design, project management, construction and operations from a variety of biopharmaceutical establishments, Biozeen can help you meet your challenges.

Biozeen's business model is unique. Our comprehensive 360-degree approach covers consulting, research-based process refinement, design-build for equipment and facilities and training services. We apply real-world knowledge for real-world measurable results.

## BIOZEEN DESIGN - BUILD SOLUTIONS

Led by the team that pioneered India's first bioreactor system, Biozeen combines extensive expertise in Bioprocess, Design, Manufacture, Automation and Validation with state-of-the-art infrastructure to offer process targeted, regulatory compliant and cost effective core plant equipment.

Designed to ASME-BPE guidelines with automation solutions developed in compliance with GAMP 4 and 21 CFR Part 11, Biozeen's unique value proposition helps our clients to leverage on our combined strengths in bioprocess and process engineering.

## BIOZEEN EQUIPMENT

Biozeen's range of bioprocess equipment spans the entire process stream, including:

- Standard laboratory fermentors/bioreactors
  - Autoclavable bench-top
  - In-situ sterilizable standalone (or floor standing)
- Multi - reactor systems
- Pilot and production-scale systems
- Media and Buffer Preparation Systems
- Filtration Systems
- Clean-in-Place Systems (CIP)
- Steam-in-Place Systems (SIP)
- Biowaste Systems
- Other customized equipment

## LAB SCALE FERMENTORS BIOREACTORS

Biozeen's lab scale fermentors / bioreactors are designed to offer ease of operation, quick turnaround and ruggedness for years of trouble-free use. Our design philosophy ensures that accessories may be added as your process needs change and that scale up is easy.

These introductory or starter systems come with glass/stainless steel vessels and come complete with steam sterilization capability. A special sampling port is employed to ensure sterile sampling, even when steam is unavailable.

- Space-conscious compact footprint
- Operation
  - Manual
  - Semi-automated
  - Fully-automated
- Modular design to adapt to changing process needs
- Interchangeable vessel: 7L, 10L and 14L
- User friendly Interface
- Control loops for
  - Temperature
  - Agitation
  - pH
  - Dissolved oxygen
  - Foam
  - Pressure
  - Gas flow
  - Turbidity
  - And many more

# FERMENTORS BIOREACTORS

Biozeen offers a broad range of fermentors and bioreactors, each one designed to meet your requirements regardless of scale: benchtop, pilot or production. With careful attention to detail and compliance with ASME BPE guidelines, you can rest assured each system is sterilizable, cleanable and validatable.

Working closely with our customers, Biozeen will assemble the right team to capture your requirements and turn them into a functional, reliable system capable of getting the most from your process. With a pilot plant on site, Biozeen offers the ability for you to run trial batches prior to finalizing your equipment. Additionally, our facilities offer an excellent opportunity for training your operators and managers, ensuring the highest level of return on your investment.

- Applications
  - Microbial
  - Cell Culture
  - Fungal
- Capacity - from 10L to 10,000L
- Layout - skid-mounted, modular, open-framed
- Design - Standard and Custom
- Instrumentation & Controls
  - Manual
  - Semi-automatic
  - Fully automatic
- Quality Documentation
- Comprehensive regulatory compliance



Biozeen CIP systems are designed to have a central station with remote recirculation pump.

- Fully automated and semi-automated
- Local recirculation and total recirculation
- Effective cleaning
- Validation spray ball coverage test, flow velocity, accurate dosing of acid and alkali temperature and conductivity
- Custom-built design with a dilution tank of 50 L upto 3,000 L to suit your specific needs
- Mobile CIP pump for recirculation
- Total control package with HMI, PLC, SCADA
- Mobile CIP and integrated SIP system

# STANDALONE CLEAN-IN-PLACE (CIP) SYSTEMS

Biozeen CIP systems are designed to provide the flexibility required to meet varying cleaning requirements. Several models - from simple manual systems to fully automated systems can be designed to suit specific requirements. Our unique design prevents the entry of dirt into the system, thereby making the CIP system available to the next user without the requirement of any intermittent cleaning.

# STANDALONE STERILIZE-IN-PLACE (SIP) SYSTEMS



Biozeen pays keen attention to current and future trends in equipment design and facility operation. Many of today's production and purification steps rely on portable equipment to address unique process needs. Biozeen designs and builds standalone sterilize-in-place systems. These SIP systems are robust and reliable support system for your facility.

Adequate cleaning, drying and storage of equipment will control bio-burden and prevent contribution of endotoxin load. Equipment should be designed to be easily assembled and disassembled, cleaned, sanitized and/or sterilized. If adequate procedures are not employed, endotoxins can be contributed by both upstream and downstream processing equipment - USFDA



# BIOWASTE SYSTEMS

Biopharmaceutical plants and operations produce waste, or effluents from their processes. Some waste products, such as those arising from genetically modified organisms, are worse than others. However, all effluents should be considered and handled properly. Using the time-proven method of heat treatment, Biozeen offers bio-waste system designs, from single-pass to push-pull. In addition to the effective inactivation of the effluent, each system is designed to conserve energy by recovering heat wherever possible. And, these critical design requirements are applied to our systems at all capacities: 100L/hr to 10,000L/hr.

- Fully automated, semi-automated and manual systems as per customer specifications
- PLC - based control system with an option of SCADA or data recovery
- 100% redundancy
- Fully CIP able and SIP able
- Multi-point temperature recording
- Multi-level password protection for safety
- Data recording for all events
- Process visible at multiple locations
- Automated control systems for Temperature, Pressure, Level and Flow



# PROCESS VESSELS

Whether upstream in buffer/media preparation or storage, downstream in filtration, transport or final fill, or in the fermentor/bioreactor itself, bioprocesses rely on the effective management of fluids. Sterilizability and cleanability are two fundamental design considerations for effective fluid management. And, as the bioprocess gets closer to the final product, hold-up volumes and product losses must be considered in every vessel design.

Upstream, downstream, fermentors, bioreactors, SIP or CIP systems, Biozeen process vessels are at the core of every process. From material selection to surface finish to nozzle/port location, each vessel is designed to meet your bioprocess requirements. Standalone or integrated within a broader plant, our vessels can be equipped with any level of instrumentation and controls.



## QUALITY MANAGEMENT

Biozeen follows an exhaustive Quality Management System to ensure complete traceability and compliance throughout the process of design, manufacture and testing. Our highly experienced teams in Process Design, Manufacturing, Automation, Testing, Validation and Documentation work in tandem using advanced tools to achieve defined objectives.

## BIOFACILITY FOR TESTING & TRAINING

Our campus houses a cGMP-compliant pilot plant facility equipped to support the complete bioprocess, from start-to-finish. With the infrastructure provided by the pilot plant and our staff of industry professionals, Biozeen offers hands-on training in a real world industrial environment.

With a dedicated FAT Centre, customers can test the equipments prior to shipment.

## CUSTOMER SUPPORT

Before, during and after the sale, Biozeen is focused on your satisfaction. You can expect our staff to be appreciative of your business and responsive to your needs.

We offer comprehensive after-sales support including in-house and field support through a network of qualified, well-trained engineers.