

# **Global Fermenters and Bioreactors Market- Distribution by Type of Product (Bioreactors and Fermenters), Fabrication Material (Glass, Stainless Steel and Single-use), Type of Bioprocess (Batch, Fed-batch and Continuous), Type of Biologic (Antibodies, Vaccines, Cell Therapies and Other Biologics), and Key Geographical Regions (North America, Europe, Asia-Pacific, Middle East and North Africa, and Latin America): Industry Trends and Global Forecasts, 2023-2035**

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## **Abstracts**

The global fermenters and bioreactors market is expected to reach USD 20.4 billion in 2023 anticipated to grow at a CAGR of 11.3% during the forecast period 2023-2035.

Since their inception in 1982, biologics have gained substantial favor due to their impressive therapeutic efficacy, favorable safety profiles, and their ability to address a diverse array of challenging medical conditions. Over the past two decades, the FDA has sanctioned the use of more than 170 biopharmaceuticals, with over 7,500 biological interventions currently undergoing scrutiny in clinical trials. Recognized widely is the necessity for highly specialized bioprocessing equipment in the production of these intricate biomolecules, whether at commercial or clinical scales. This equipment is indispensable for maintaining precise control over crucial bioprocess parameters, including temperature, pH levels, dissolved oxygen, fluid delivery, and other vital conditions necessary for consistent cell growth. Among this specialized equipment, bioreactors hold a pivotal role in upstream manufacturing processes by engineering

optimal conditions that foster cell growth, facilitating the production of significant quantities of recombinant proteins. These proteins encompass a broad spectrum of therapeutic agents, such as vaccines, fusion proteins, antibodies, and enzymes. Notably, bioreactors also possess the capacity to produce Advanced Therapy Medicinal Products (ATMPs) like cell and gene therapies, retroviral vectors for gene therapy, and the cellular components integral to three-dimensional tissue constructs.

In contrast, fermenters find utility in the anaerobic cultivation of microbial cell populations, especially fungal or bacterial cells, to produce biologics that do not require significant post-translational modifications. It is noteworthy that employing fermenters for biologics manufacturing offers advantages including accelerated development timelines, improved yields and quality, minimized batch-to-batch variations, greater scalability, and reduced production costs when compared to manufacturing processes conducted in bioreactors.

## Report Coverage

The analysis investigates the fermenters and bioreactors market, examining product types, fabrication materials, bioprocess variations, biologic types, and major geographical regions.

An evaluation is conducted on market growth factors (such as drivers, restraints, opportunities, and challenges) impacting the industry.

It assesses the potential advantages and hurdles within the market, providing insights into the competitive landscape for key industry players.

Revenue forecasts for market segments are provided concerning five significant regions.

A comprehensive executive summary encapsulates research insights, delineating the current state and future trajectory of the global fermenters and bioreactors market over the medium to long term. The section starts with a fundamental overview of bioreactors and fermenters, encompassing their constituent elements.

Subsequently, a detailed analysis scrutinizes the market landscape of companies involved in bioreactor and fermenter manufacturing, examining critical parameters such as establishment timelines, company size by employee

count, headquarters' regional locations, global reach across North America, Europe, Asia-Pacific, and Rest of the World, product types, operational capacities spanning micro-mini to large-scale, operational scales (preclinical, clinical, and commercial), scalability, bioprocess methodologies (batch, fed-batch, and continuous), cell culture types (2D, 3D, and 4D), operational modes (manual, semi-automatic, and automatic), and end-user categories (academic institutes, research laboratories, biopharmaceutical and pharmaceutical industries, contract manufacturing organizations, and contract research organizations).

A comprehensive assessment of the competitive landscape in fermenter and bioreactor manufacturing is presented. This evaluation focuses on manufacturers' strengths in terms of experience, company size, robust portfolio encompassing geographical outreach, product types, portfolio size, bioreactor/fermenter types, capacities, operational scales, scalability, bioprocess methods, cell culture types, operational modes, and end-user targets.

In-depth profiles of pivotal fermenter and bioreactor manufacturers, selected based on cumulative strengths and product portfolios, are outlined. Each profile includes a concise company overview, pertinent financial information (where available), product portfolios, recent developments, and an insightful future outlook.

The global installed capacity of bioreactors and fermenters, dedicated to biologics production, is estimated using publicly available data. This estimation details the distribution of capacity across fabrication materials (glass, stainless steel, single-use), cell culture sources (mammalian, microbial, others), reactor volumes, manufacturer types (in-house, hybrid, CMOs), and key geographical regions (North America, Europe, Asia-Pacific, Rest of the World).

A detailed case study scrutinizes the market landscape of bioprocess controllers and automation systems, elucidating their scale of operation (laboratory, clinical, commercial), prominent features (scalability, user-friendliness, visual data display, remote accessibility, system control sensors, I/O compatibility, alarm/alert provisions), compatibility with various bioreactor systems, supported bioprocess types, and controlled process types. Furthermore, it provides insights into companies developing bioprocess control software, upstream and downstream controllers, including establishment timelines, company sizes, and headquarters' locations.

## Key Market Companies

Applikon Biotechnology

Bionet

Cytiva

Eppendorf

Merck

Ollital Technology

Parr Instrument Company

Sartorius

Shanghai Bailun Biological Technology

Solaris Biotech

Solida Biotech

Zhengzhou Labao Instrument Equipment (LABAO)

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