

Single-Use Bioreactors Market to Reach US\$8.5Bn by 2033 at 10.4% CAGR | Persistence Market Research

Global single-use bioreactors market driven by biologics growth, flexible manufacturing, and rising demand for scalable bioprocessing solutions.

LONDON, UNITED KINGDOM, March 4, 2026 /EINPresswire.com/ -- The global [single-use bioreactors market](#) is projected to be valued at US\$ 4.2 billion in 2026 and is forecast to reach US\$ 8.5 billion by 2033, expanding at a CAGR of 10.4% between 2026 and 2033. This growth trajectory reflects the accelerating transition from conventional stainless-steel systems to flexible, disposable bioprocessing platforms across biologics and advanced therapy manufacturing.

Rising demand for monoclonal antibodies, recombinant proteins, vaccines, and cell and gene therapies is driving widespread adoption of single-use technologies. Biopharmaceutical companies and contract development and manufacturing organizations (CDMOs) increasingly favor disposable bioreactors to minimize capital expenditure, reduce cleaning validation requirements, and mitigate cross-contamination risks. These advantages are particularly critical in multi-product facilities and clinical-scale production environments where rapid changeovers and operational agility are essential.

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Investments in biomanufacturing infrastructure across North America, Europe, and Asia Pacific are further strengthening demand. Modular, scalable single-use stirred-tank and wave-induced



single-use bioreactors market

motion systems enable faster facility deployment and seamless scale-up from process development to commercial manufacturing. As regulatory agencies emphasize contamination control and pandemic preparedness, single-use bioreactors are becoming central to next-generation bioprocessing strategies.

Market Dynamics

Drivers – Expanding Biologics, Vaccine, and Advanced Therapy Manufacturing

The rapid expansion of biologics and advanced therapies remains the primary growth driver. Biologics now account for approximately 35–40% of global pharmaceutical R&D activity, and a growing proportion of new approvals involve complex biologics and biosimilars. These therapies require flexible, scalable manufacturing platforms capable of supporting diversified product pipelines.

Single-use bioreactors enable faster facility construction and reduced downtime compared to stainless-steel systems. By eliminating cleaning-in-place (CIP) and sterilization-in-place (SIP) requirements, disposable systems improve asset utilization and shorten production cycles. The success of mRNA and viral vector vaccines during the COVID-19 pandemic highlighted the value of rapidly reconfigurable manufacturing lines built on single-use technologies.

Operational Efficiency and Sustainability Benefits

Operational efficiency is another key growth catalyst. Pre-sterilized, gamma-irradiated disposable assemblies significantly reduce contamination risks, making them ideal for multiproduct CDMO facilities. Facilities adopting single-use systems can achieve 20–30% reductions in water and energy consumption compared to traditional stainless-steel setups. These resource savings align with corporate sustainability goals while maintaining compliance with stringent regulatory standards.

Restraints – Extractables, Leachables, and Material Compatibility

Despite strong adoption trends, extractables and leachables (E&L) concerns present a restraint. Polymer-based components may release trace compounds into biologic products, necessitating extensive risk assessments and validation studies. These requirements can increase development timelines and costs.

Material compatibility challenges may also limit applicability for certain media formulations or highly sensitive therapeutic modalities. Manufacturers often adopt hybrid facilities that combine stainless-steel and single-use technologies to balance risk and flexibility.

Mechanical and Environmental Challenges

Mechanical integrity risks, such as bag tears or leaks in large-volume systems, remain a concern.

Although film technology and design improvements have reduced failure rates, some manufacturers remain cautious about scaling disposable systems beyond 2,000–3,000 liters. Additionally, polymeric waste generation has prompted environmental scrutiny, encouraging suppliers to explore recycling and waste-to-energy solutions.

Opportunity – Cell and Gene Therapy Expansion

The expanding pipeline of more than 1,500 active cell and gene therapy programs presents a compelling growth opportunity. These therapies require small-batch, high-value manufacturing supported by closed, contamination-controlled systems. Single-use bioreactors are particularly suitable for viral vector production and cell expansion processes, offering scalability and rapid deployment for clinical and commercial supply.

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Category-wise Analysis

Product Insights

Single-use bioreactor systems account for approximately 43% of the market in 2025, reflecting their central role in upstream cell culture operations. These systems integrate seamlessly with disposable media bags, filtration units, and downstream assemblies, enabling fully single-use process trains. Continuous innovation in film chemistry, sensor integration, and automation enhances mixing efficiency and oxygen transfer performance.

Bioreactor Type Analysis

Stirred-tank single-use bioreactors represent the dominant configuration, estimated to command over 55–60% of the market by 2025. Their well-characterized hydrodynamics and scalability mirror traditional stainless-steel designs, simplifying process transfer and scale-up. Stirred-tank systems are widely used for monoclonal antibody, recombinant protein, and vaccine production due to reliable mixing and mass transfer performance.

End-user Insights

Biopharma and pharmaceutical companies account for roughly 60% of total demand in 2025. These organizations deploy single-use systems across clinical and commercial facilities to accelerate product launches and manage diverse pipelines. CDMOs and CROs also represent significant adopters, leveraging disposable platforms for flexible, multi-client manufacturing operations.

Regional Insights

North America leads the global market, supported by strong biologics R&D activity and regulatory frameworks emphasizing contamination control. Europe follows with robust adoption across biosimilar and multiproduct manufacturing clusters. Asia Pacific is the fastest-growing region, driven by expanding biologics and vaccine capacity in China, India, South Korea, and Japan. National initiatives promoting domestic biomanufacturing and export-oriented CDMO growth are accelerating regional uptake.

Competitive Landscape

The market features established life sciences equipment providers and specialized single-use technology companies competing on scalability, automation, and reliability. Key players include Sartorius AG, Merck KGaA, Danaher Corporation, Thermo Fisher Scientific, Pall Corporation, Eppendorf SE, and ABEC, Inc..

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Market Segmentation

By Product

- Single-use Bioreactor Systems
- Single-use Media Bags
- Single-use Filtration Assemblies
- Others

By Bioreactor Type

- Stirred-tank Single-use Bioreactors (SUBs)
- Wave-induced Motion Bioreactors
- Bubble Column Bioreactors
- Others

By End-user

- CROs & CMOs
- Academic & Research Institutes
- Biopharma & Pharma Companies

By Region

- North America
- Europe

East Asia
South Asia & Oceania
Latin America
Middle East & Africa

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