

Flexible Manufacturing Systems for Pharmaceutical Industry to Grow from \$2 Billion in 2021 to \$3.3 Billion by 2031

Flexible Manufacturing Systems for Pharmaceutical Industry Market Size, Share, Competitive Landscape and Trend Analysis Report

WILMINGTON, DE, UNITED STATES, July 8, 2025 /EINPresswire.com/ -- Introduction
According to a report by Allied Market Research, the [global flexible manufacturing systems \(FMS\) for the pharmaceutical industry](#) market was valued at \$2 billion in 2021 and is projected to reach \$3.3 billion by 2031, growing at a compound annual growth rate (CAGR) of 5.3% from 2022 to 2031. Flexible manufacturing systems enable pharmaceutical companies to swiftly adapt to changing market and industry conditions, optimizing the use of facilities, plants, and resources to maintain profitability and competitiveness. This report examines the market's growth drivers, segmentation, regional trends, competitive landscape, and the impact of external factors such as the COVID-19 pandemic, providing a comprehensive analysis of trends and opportunities shaping the industry.

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Overview of Flexible Manufacturing Systems

Flexible manufacturing systems in the pharmaceutical industry are designed to allow rapid adaptation to evolving demands, such as changes in drug production requirements, regulatory standards, or market needs. These systems encompass technologies and processes that enable manufacturers to switch between product types, scale production, or reconfigure operations with minimal downtime. FMS includes modular manufacturing, data-driven manufacturing, single-use manufacturing, and continuous manufacturing, all of which enhance efficiency and reduce costs.

The pharmaceutical industry is inherently complex, driven by stringent government regulations, international trade policies, and the emergence of new diseases. The need for rapid operational changes, such as modifying machinery or reconfiguring entire facilities, often poses challenges to profitability. FMS addresses these issues by enabling quick changeovers, ensuring manufacturers remain agile and competitive in a dynamic environment.

Market Dynamics

The growth of the FMS market is driven by several key factors. The rising global population, particularly the aging demographic, has increased the demand for both generic and specialized pharmaceuticals. According to the World Health Organization, the global population aged 60 and older was 1 billion in 2019 and is expected to reach 1.4 billion by 2030 and 2.1 billion by 2050. This demographic shift has led to a surge in chronic diseases, driving the need for efficient drug production systems.

Increased healthcare spending in developed and developing countries further fuels market growth. For instance, the U.S. Centers for Medicare & Medicaid Services reported that U.S. healthcare spending reached \$4.1 trillion in 2020, accounting for 19.7% of GDP, with a per capita expenditure of \$12,530. This investment in healthcare infrastructure supports the adoption of advanced manufacturing systems to meet rising pharmaceutical demand.

The unpredictable nature of the pharmaceutical industry, marked by frequent regulatory changes and the emergence of new viruses, underscores the importance of flexibility. FMS enables manufacturers to adapt quickly to new production requirements, such as developing vaccines or scaling up drug production, without significant financial or operational setbacks.

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Impact of COVID-19

The COVID-19 pandemic significantly impacted the FMS market, as it highlighted the critical need for adaptable manufacturing systems. The rapid spread of the virus disrupted global trade, economies, and supply chains, forcing pharmaceutical companies to pivot quickly to produce vaccines and treatments. FMS played a pivotal role in enabling manufacturers to scale up production and reconfigure facilities to meet urgent demands.

The introduction of COVID-19 vaccines and the subsequent decline in infection rates have facilitated market recovery. By 2022, companies involved in FMS development resumed full-scale operations, driven by increased awareness of the need for efficient healthcare operations. The pandemic underscored the value of flexible systems, and this awareness is expected to continue driving market growth as manufacturers prioritize resilience and adaptability.

Market Segmentation

The FMS market for the pharmaceutical industry is segmented by product type, technology, end user, and region, providing insights into growth patterns and opportunities.

By Product Type

The market is categorized into modular manufacturing, data-driven manufacturing, single-use manufacturing, and continuous manufacturing. Modular manufacturing allows for scalable and customizable production setups, while data-driven manufacturing leverages analytics to optimize processes. Single-use manufacturing reduces contamination risks and setup times, and continuous manufacturing enhances efficiency by enabling nonstop production. Each type

addresses specific industry needs, with continuous manufacturing expected to see significant growth due to its efficiency and scalability.

By Technology

The market is divided into software and hardware segments. Software solutions, including automation and data analytics platforms, enable real-time monitoring and process optimization. Hardware components, such as modular production units and automated machinery, provide the physical infrastructure for flexible manufacturing. Both segments are critical to the adoption of FMS, with software gaining traction due to advancements in digital technologies.

By End User

The market is bifurcated into large pharmaceutical manufacturers and medium and small pharmaceutical manufacturers. Large manufacturers dominated the market in 2021, leveraging their resources to invest in advanced FMS technologies. However, medium and small manufacturers are expected to adopt FMS at a growing rate, driven by the need to remain competitive in a dynamic market.

By Region

North America held the largest market share in 2021, driven by significant healthcare investments and a robust pharmaceutical industry in the U.S. and Canada. However, Asia-Pacific is anticipated to register the highest growth rate during the forecast period, fueled by population growth, rising healthcare spending, and increasing pharmaceutical production in countries like China and India. Europe and LAMEA also contribute to the market, with growth driven by regulatory advancements and infrastructure development.

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Competitive Landscape

The FMS market is competitive, with key players focusing on innovation, partnerships, and acquisitions to strengthen their market position. Companies profiled in the report include Angstrom Technology, Biologics Modular, LLC, Chempharm, Cytiva, ESC (Environmental Systems Corporation), Exyte GmbH, G-CON Manufacturing, Germfree Laboratories Inc., IPM Technologies, KeyPlants Ab, ModuleCo Ltd., Modwave LLC, Nicomac Srl, NNE, Pharmadule Morimatsu AB, PR Pharma, and Engineers Pvt. Ltd., and Univercells Technologies. These players are investing in advanced technologies, such as single-use and continuous manufacturing systems, to meet evolving industry demands.

Future Outlook

The FMS market for the pharmaceutical industry is poised for steady growth through 2031, driven by demographic trends, increased healthcare spending, and the need for operational agility. The market's projected value of \$3.3 billion by 2031 reflects its critical role in enabling

pharmaceutical manufacturers to navigate a complex and dynamic industry. Advancements in digital technologies, such as data-driven manufacturing, and the growing adoption of sustainable practices will further shape the market's trajectory.

Key Findings

The market was valued at \$2 billion in 2021 and is projected to reach \$3.3 billion by 2031, with a CAGR of 5.3%.

Modular and continuous manufacturing systems are gaining traction for their scalability and efficiency.

North America led the market in 2021, while Asia-Pacific is expected to register the highest growth rate.

The COVID-19 pandemic highlighted the importance of FMS, driving market recovery by 2022.

Large pharmaceutical manufacturers dominate, but medium and small manufacturers are adopting FMS at a growing rate.

Key players are focusing on innovation and sustainability to remain competitive.

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Contact us:

United States

1209 Orange Street,

Corporation Trust Center,

Wilmington, New Castle,

Delaware 19801 USA.

Int'l: +1-503-894-6022

Toll Free: +1-800-792-5285

Fax: +1-800-792-5285

help@alliedmarketresearch.com

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[Construction blog](#)

David Correa

Allied Market Research

+ 1 800-792-5285

[email us here](#)

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