

Cryogenic Freezers Market Report by Product Type (Tunnel Freezer, IQF Freezer, Immersion Freezer, Spiral Freezer, and Others), Application (Corporate Laboratories, Hospitals and Blood Centers, Universities and Research Institutions, and Others), End Use Industry (Food and Beverages, Medical and Healthcare, Pharmaceuticals, Chemicals, and Others), and Region 2024-2032

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Abstracts

The global cryogenic freezers market size reached US\$ 207.5 Million in 2023. Looking forward, IMARC Group expects the market to reach US\$ 330.6 Million by 2032, exhibiting a growth rate (CAGR) of 5.2% during 2024-2032. The rising demand in bio-banking sectors for the long-term preservation of biological samples, increasing product requirements in genomic research, and rising urgency of ultra-low temperature storage needs represent some of the factors that are propelling the market.

A cryogenic freezer is a specialized refrigeration system engineered to maintain ultra-low temperatures, typically ranging from -150°C to -196°C (-238°F to -320°F). These freezers are principally designed to preserve biological samples, such as blood, tissues, and cells, for extended periods while minimizing cellular changes. Built with advanced insulation materials and cooling technologies, these units efficiently attain and sustain their ultra-low temperature settings. They often employ liquid nitrogen or liquid carbon dioxide as the refrigerant, although mechanical systems are also available. The mechanism behind these freezers involves a two-stage refrigeration process; the first stage usually brings the temperature down to around -40°C, and the subsequent stage achieves the ultra-low temperature. This double-cooling process ensures minimal

thermal fluctuations, making these freezers pivotal in various research, medical, and industrial applications.

The global market for cryogenic freezers is primarily driven by the rising demand in bio-banking sectors for the long-term preservation of biological samples. In line with this, the increasing product requirements in genomic research are also elevating the market's prospects. Moreover, the rising urgency of ultra-low temperature storage needs amid the COVID-19 pandemic acts as a significant factor contributing to market growth. In addition to this, the growing adoption within the pharmaceutical and healthcare industries to preserve drug efficacy is also propelling market expansion. Furthermore, the integration of advanced, real-time monitoring technologies such as the internet of things (IoT) into these freezers presents a positive market outlook. The market is also fueled by stringent regulatory requirements for efficient cold chain management in healthcare and food industries. Alongside this, greater awareness regarding the importance of specimen integrity in medical research is driving market adoption. Some of the other factors contributing to the market include the increasing number of organ transplants that require reliable ultra-low temperature storage, and the growing reliance on personalized medicine.

Cryogenic Freezers Market Trends/Drivers:

Advances in Medical Research and Diagnostics

One pivotal factor influencing the market for cryogenic freezers is the advancements in medical research and diagnostics. As healthcare institutions and research organizations delve deeper into understanding diseases at a molecular level, the need for storing biological samples at ultra-low temperatures becomes paramount. This enables precise analyses and paves the way for the discovery of new treatment methods, medications, and vaccines. As we see an increase in the number of research programs focused on complex diseases such as cancer, Alzheimer's, and various infectious diseases, the demand for reliable and high-capacity cryogenic storage solutions grows. High-throughput screenings and complex assays require large volumes of preserved biological matter. Only with ultra-low temperature storage can these samples be kept viable for extended periods, ensuring the integrity of years-long studies and potentially life-saving research.

Increased regulatory oversight and quality standards

Another major driver for the market is the intensified focus on regulatory oversight and quality standards across the globe. The storage of biological samples is not just a

matter of convenience but often a regulatory requirement. Numerous institutions in several countries are facing stricter guidelines about how biological materials should be stored, handled, and documented. Such regulations are particularly rigorous in clinical trials and pharmaceutical research where the efficacy and safety of new drugs are examined. Non-compliance with these regulations can lead to severe repercussions, including financial penalties and loss of reputation. Therefore, the adoption of cryogenic freezers that meet these high-quality standards is not optional but essential. The implementation of such storage solutions assures compliance, thereby mitigating risks and facilitating a smoother research process.

Global expansion of biotechnology firms

The worldwide expansion of biotechnology firms is a substantial force driving the cryogenic freezers market. As these organizations broaden their reach, moving beyond domestic markets into international arenas, the requirement for robust, reliable, and centralized cryogenic storage solutions becomes ever more crucial. These firms are often involved in groundbreaking research and product development activities that span multiple scientific disciplines, from genomics to personalized medicine and even agricultural biotechnology. The value of the biological samples used in such wide-ranging applications is immense, both in terms of financial worth and scientific utility. As the company scales, the complexity of managing these biological assets also increases exponentially. Standardizing storage across multiple locations, while ensuring each meets the necessary quality and safety regulations of their respective jurisdictions, becomes a logistical challenge of significant proportions.

Cryogenic Freezers Industry Segmentation:

IMARC Group provides an analysis of the key trends in each segment of the global cryogenic freezers market report, along with forecasts at the global and regional levels from 2024-2032. Our report has categorized the market based on product type, application and end use industry.

Breakup by Product Type:

Tunnel Freezer

IQF Freezer

Immersion Freezer

Spiral Freezer

Others

Tunnel freezer represents the largest market segment

The report has provided a detailed breakup and analysis of the market based on the product type. This includes tunnel freezer, IQF freezer, immersion freezer, spiral freezer and others. According to the report, tunnel freezer represented the largest segment.

The tunnel freezer segment in the cryogenic freezers market is primarily driven by the increasing demand for fast and efficient freezing solutions in the food and beverage industry. These freezers offer large-scale freezing capacity, which makes them ideal for industrial applications. The rise in the adoption of automation in food processing facilities is contributing to the segment's growth. Additionally, stringent food safety regulations are pushing manufacturers to invest in reliable and quick freezing solutions. Environmental benefits, such as lower energy consumption compared to traditional methods, further boost the segment's attractiveness.

On the other hand, IQF, immersion, and spiral freezers are gaining traction due to their specialized applications in sectors like seafood, fruits, and vegetables. These freezers offer the advantage of freezing individual items quickly, thus maintaining quality. Innovative technological advancements in these freezers are also contributing to market growth.

Breakup by Application:

- Corporate Laboratories
- Hospitals and Blood Centers
- Universities and Research Institutions
- Others

Hospitals and blood centers represent the largest market segment

The report has provided a detailed breakup and analysis of the market based on the application. This includes corporate laboratories, hospitals and blood centers, universities and research institutions, and others. According to the report, hospitals and blood centers represented the largest segment.

The hospitals and blood centers segment in the cryogenic freezers market is largely propelled by the increasing need for the safe storage of blood, organs, and other biological samples. These freezers are essential for preserving the viability of these biological materials for extended periods. Rising awareness about blood donation and the expansion of healthcare infrastructure globally are other significant factors driving

this segment. Strict regulatory guidelines for medical storage conditions also influence the adoption rate of cryogenic freezers in hospitals. Aging populations and the growing prevalence of chronic diseases necessitate more advanced freezing solutions, augmenting market demand.

On the other hand, corporate laboratories, universities, and research institutions employ cryogenic freezers for purposes like tissue storage and long-term biological research. Technological advancements in research methods and the rise in R&D funding contribute to the growth of these segments.

Breakup by End Use Industry:

- Food and Beverages
- Medical and Healthcare
- Pharmaceuticals
- Chemicals
- Others

Medical and healthcare accounts for the majority of the market share

The report has provided a detailed breakup and analysis of the market based on the end use industry. This includes food and beverages, medical and healthcare, pharmaceuticals, chemicals, and others. According to the report, medical and healthcare represented the largest segment.

The medical and healthcare segment is a prominent driver in the cryogenic freezers market, buoyed by factors like rising pharmaceutical research, the growing requirement for long-term storage of medical supplies, and increasing healthcare expenditure. Enhanced focus on personalized medicine also requires advanced freezing solutions for storing specialized therapies and diagnostics. In addition, the growth in organ transplant procedures globally necessitates reliable freezing technologies for organ preservation. The COVID-19 pandemic has especially emphasized the importance of secure storage solutions for vaccines and other critical medical supplies. The ongoing development and distribution of vaccines also play a pivotal role in boosting this segment.

On the other hand, the food and beverages, pharmaceuticals, and chemicals sectors utilize cryogenic freezers for specific, often specialized, applications. These include the preservation of flavor profiles in food items, storing sensitive pharmaceutical compounds, and maintaining the stability of chemical substances.

Breakup by Region:

North America

Europe

Asia Pacific

Middle East and Africa

Latin America

North America exhibits a clear dominance, accounting for the largest cryogenic freezers market share

The market research report has also provided a comprehensive analysis of all the major regional markets, which include North America; Europe; Asia Pacific; the Middle East and Africa; and Latin America. According to the report, North America accounted for the largest market share.

The North America region holds a significant share in the global cryogenic freezers market, driven by factors such as advanced healthcare infrastructure, robust food processing industries, and high R&D spending in both academic and corporate sectors. The presence of major market players in the region also contributes to its dominance.

In addition to this, the increasing awareness regarding blood and organ donations fuels the market, especially in healthcare applications. Regulatory compliance is another key driver, with institutions following strict guidelines for storage solutions. In addition to healthcare, the North American food industry's adoption of high-throughput, automated freezing solutions contributes to market growth.

With the United States and Canada leading in both healthcare and food processing sectors, it significantly influences market trends. Also, the COVID-19 pandemic and the rising prevalence of numerous related diseases has resulted in a significant demand for cryogenic freezers for vaccine storage. Furthermore, the rise in personalized medicine and the adoption of innovative technologies in freezing solutions continue to offer growth opportunities in this region.

Competitive Landscape:

The leading companies are making strides in technology to offer better temperature control and energy-efficient solutions. They are collaborating with healthcare and research institutions to understand their specific needs, thereby customizing their product offerings. Emphasis is laid on providing smart features like remote monitoring

and data logging to offer added convenience to users. These key players are also exploring emerging markets and establishing distribution channels to widen their global footprint. Investments are made in automation to increase production efficiency and reduce operational costs. Attention is paid to adhering to international quality and safety standards, giving them a competitive edge. Partnerships are often established with local vendors for quicker service and maintenance. These companies are also actively involved in mergers and acquisitions to diversify their product portfolios and expertise.

The report has provided a comprehensive analysis of the competitive landscape in the market. Detailed profiles of all major companies have also been provided. Some of the key players in the market include:

Thermo Fisher Scientific Inc.
Panasonic Corporation
Chart Industries, Inc.
Haier Group
DAIHAN Scientific
Froilabo
Arctiko
Taylor-Wharton
VRV Group
Aucma Co., Ltd.
Zhongke Meiling Cryogenics Company Limited

Recent Developments:

In August 2023, Thermo Fisher Scientific, the world leader in serving science, today announced the commercial launch of the EXENT Solution, after receiving IVDR certification. The EXENT solution is a fully integrated and automated mass spectrometry system designed to transform diagnosis and assessment for patients with monoclonal gammopathies, including multiple myeloma.

In July 2023, Panasonic Corporation introduced Kinari, a sustainable alternative to traditional plastics. Developed by a team of eco-conscious engineers, Kinari is a high-density material made from cellulose fibers sourced from waste plant materials, bonded with a minimal amount of oil-based resin. The innovation aims to advance sustainability and contribute to a circular society.

In July 2023, Chart Industries, Inc. and New Zealand's Fabrum have partnered to produce and sell Micro-Scale Liquefiers aimed at meeting the growing demand for hydrogen and other gas liquefaction systems. These liquefiers support small-scale liquid hydrogen production and have applications in sustainable transport, industrial use, and

energy self-sufficiency.

Key Questions Answered in This Report

1. What was the size of the global cryogenic freezers market in 2023?
2. What is the expected growth rate of the global cryogenic freezers market during 2024-2032?
3. What are the key factors driving the global cryogenic freezers market?
4. What has been the impact of COVID-19 on the global cryogenic freezers market?
5. What is the breakup of the global cryogenic freezers market based on the product type?
6. What is the breakup of the global cryogenic freezers market based on the application?
7. What is the breakup of the global cryogenic freezers market based on the end use industry?
8. What are the key regions in the global cryogenic freezers market?
9. Who are the key players/companies in the global cryogenic freezers market?

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