

# Global Freeze Dryers Market Growth 2026-2032

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## Abstracts

The global Freeze Dryers market size is predicted to grow from US\$ 1053 million in 2025 to US\$ 1462 million in 2032; it is expected to grow at a CAGR of 4.8% from 2026 to 2032.

In 2025, global Freeze Dryers production reached approximately 16,535 units, with a average price at 65.1 K USD per unit.

Lyophilizers (Freeze Dryers) are machines for Freeze-drying .Freeze-drying?technically known as lyophilisation, lyophilization, or cryodesiccation?is a dehydration process typically used to preserve a perishable material or make the material more convenient for transport. Freeze-drying works by freezing the material and then reducing the surrounding pressure to allow the frozen water in the material to sublime directly from the solid phase to the gas phase.

A freeze dryer, or lyophilizer, is a critical processing system that removes water through three interdependent stages?freezing, primary drying by sublimation, and secondary drying by desorption?under vacuum conditions. Its strategic value lies not merely in dehydration, but in preserving the stability, activity, reconstitution performance, and shelf life of heat-sensitive products such as biologics, peptides, vaccines, sterile injectables, laboratory samples, and high-value foods. In pharmaceutical manufacturing, the modern freeze dryer is no longer a stand-alone chamber: it is an integrated engineering platform combining the drying chamber, condenser, refrigeration, vacuum, shelf temperature control, CIP/SIP, sterile filtration, automated loading and unloading, isolator integration, and digital monitoring. This makes it one of the most technically demanding and validation-intensive units in sterile production.

Commercially, the freeze dryer business follows a ?modular platform + customized engineering + lifecycle service? model. Leading suppliers typically build on standardized

core platforms, then customize around the customer's process, cleanroom grade, throughput, regulatory requirements, and plant layout. Revenue therefore comes not only from the machine itself, but also from installation, commissioning, validation, software controls, automated loading/unloading, isolator integration, spare parts, and after-sales services. IMA explicitly presents its freeze-drying systems as modular and customizable solutions for pharmaceutical and biotech production, with strong integration into isolators, automated handling, and GMP Annex 1 compliance; Tofflon similarly emphasizes freeze-drying systems as part of broader end-to-end process and engineering solutions. In margin terms, a reasonable industry reading for complete freeze-dryer systems is roughly 30%-40%, inferred from comparable listed pharmaceutical equipment disclosures: Chutian reported a 30.35% comprehensive gross margin in 2025H1, while a brokerage analysis based on annual-report data showed comparable sales gross margins broadly in the 32.83%-39.68% range; meanwhile, ToFFlon disclosed that intensified competition and slower biopharma capex have pressured industry profitability in 2024-2025. Upstream, the chain is built on stainless-steel vessels, compressors, heat exchangers, vacuum pumps, valves, sensors, PLC/SCADA, isolators, filters, and refrigerant systems; midstream consists of design, fabrication, automation, testing, and qualification; downstream demand comes mainly from sterile injectables, biologics, vaccines, complex formulations, life-science laboratories, and premium food and nutrition processing.

### Market Development Opportunities & Main Driving Factors

The core opportunity in the freeze-dryer market has shifted from routine replacement demand for traditional lyophilized powder lines to a four-way resonance of innovation-drug expansion, higher-end sterile manufacturing, domestic substitution in equipment, and global delivery capability. On the policy side, China's 14th Five-Year National Health Plan calls for stronger pharmaceutical innovation, faster industrialization of drugs for major diseases, and more robust emergency drug R&D and manufacturing systems. The 2026 central budget report further supports large-scale equipment renewal and explicitly treats biomedicine as a strategic emerging pillar industry. On the demand side, official Chinese data show that 76 innovative drugs were approved in 2025, up sharply from 2024, with biologics also gaining importance—expanding the installed base for sterile injectables, lyophilized formulations, and higher-standard production equipment. On the supply side, brokerage research argues that China's pharmaceutical-equipment industry is moving away from a purely GMP-cycle-driven model toward a dual-engine growth model led by both demand and capability expansion; GEA likewise reported that order growth in its Food & Healthcare Technologies division was driven by both food and pharma. For executives and investors, the implication is clear: freeze dryers are no

longer a niche machine category, but a strategic control point in biopharma line upgrading, scale-up, international certification, and turnkey competitiveness.

### Market Challenges, Risks, & Restraints

This is not a straight-line growth story, because the market's real difficulty lies in converting high expectations into compliant, profitable execution. First, biopharma customers in China slowed fixed-asset spending and capacity expansion during 2024-2025; Tofflon publicly disclosed that clients tightened control over pipeline and capacity-investment costs, which weakened near-term pharma-equipment demand, intensified competition, and pressured gross margins. Second, regulatory requirements continue to rise: the FDA treats lyophilized drug manufacturing as a complex system involving formulation, filling validation, sterilization engineering, and final-product testing, while EU GMP Annex 1 has strengthened expectations around contamination control, equipment qualification, cleaning and disinfection, personnel capability, and continuous monitoring of temperature, pressure, and time. Third, environmental rules are beginning to reshape technology choices: GEA notes that EU F-Gas Regulation 2024/573 entered into force in March 2024, bringing tighter HFC quotas, export restrictions, and lower-GWP refrigerant requirements that increase system-design and retrofit complexity. In practical terms, competition is no longer about who can build a chamber, but about who can simultaneously deliver regulatory compliance, process reliability, automation, sustainability, and predictable execution.

### Downstream Demand Trends

Downstream demand is migrating from standardized lyophilized powder injectables toward complex sterile formulations and other higher-value scenarios, and that transition is reshaping both the product mix and the value mix of freeze dryers. IMA states that its freeze-drying platforms span laboratory development through commercial production and are suited to complex formulations, biopharmaceutical applications, and scale-up; its Lab4Life facility, launched in 2025, was built specifically to support customer development, scale-up, and qualification work. Tofflon, meanwhile, highlights the irreplaceable role of lyophilization in advanced nucleic-acid drugs, cell therapies, and tissue-regeneration processes. At the same time, GEA reported in 2024 that order growth in Food & Healthcare Technologies was driven by both food and pharma, signaling that premium foods, nutrition products, and life-science sample handling are becoming important growth vectors beyond pharmaceutical manufacturing. Over the next several years, the highest-value demand is likely to cluster around sterile injectables, biologics, vaccines, dual-chamber lyophilization, long-acting complex

formulations, and production environments that demand higher automation, lower energy use, and stronger data integrity. The companies that can combine process development, qualification, digital control, and greener refrigeration into one system capability will be best positioned to win premium orders.

LP Information, Inc. (LPI) ' newest research report, the 'Freeze Dryers Industry Forecast' looks at past sales and reviews total world Freeze Dryers sales in 2025, providing a comprehensive analysis by region and market sector of projected Freeze Dryers sales for 2026 through 2032. With Freeze Dryers sales broken down by region, market sector and sub-sector, this report provides a detailed analysis in US\$ millions of the world Freeze Dryers industry.

This Insight Report provides a comprehensive analysis of the global Freeze Dryers landscape and highlights key trends related to product segmentation, company formation, revenue, and market share, latest development, and M&A activity. This report also analyzes the strategies of leading global companies with a focus on Freeze Dryers portfolios and capabilities, market entry strategies, market positions, and geographic footprints, to better understand these firms' unique position in an accelerating global Freeze Dryers market.

This Insight Report evaluates the key market trends, drivers, and affecting factors shaping the global outlook for Freeze Dryers and breaks down the forecast by Type, by Application, geography, and market size to highlight emerging pockets of opportunity. With a transparent methodology based on hundreds of bottom-up qualitative and quantitative market inputs, this study forecast offers a highly nuanced view of the current state and future trajectory in the global Freeze Dryers.

This report presents a comprehensive overview, market shares, and growth opportunities of Freeze Dryers market by product type, application, key manufacturers and key regions and countries.

Segmentation by Type:

Lab-scale Freeze Dryers

Pilot-scale Freeze Dryers

Industrial-scale Freeze Dryers

### Segmentation by Technology:

Rotary Freeze Dryers

Manifold Freeze Dryers

Tray Freeze Dryers

Others

### Segmentation by Style:

Bench-top Freeze Dryers

Free-standing Freeze Dryers

### Segmentation by Application:

Pharmaceutical

Food Processing Industry

Biotechnology and Environment

Scientific Research

Others

This report also splits the market by region:

Americas

United States

Canada

Mexico

Brazil

APAC

China

Japan

Korea

Southeast Asia

India

Australia

Europe

Germany

France

UK

Italy

Russia

Middle East & Africa

Egypt

South Africa

Israel

Turkey

## GCC Countries

The below companies that are profiled have been selected based on inputs gathered from primary experts and analysing the company's coverage, product portfolio, its market penetration.

GEA

Tofflon

IMA

Azbil Telstar

OPTIMA

KYOWAC (Nissei)

SP Industries (ATS)

Labconco

HOF Sonderanlagenbau GmbH

Martin Christ

MechaTech Systems

Millrock Technology

TruKing Technology

ilShinBioBase

ZIRBUS Technology

LaboGene

Cuddon Freeze Dry

Tokyo Rikakikai (EYELA)

Freezedry Specialties, Inc.

Lyophilization Systems, Inc. (LSI)

Vikumer Freeze Dry

Coolvacuum (Dara Pharma)

ULVAC

RheaVita

OPERON

Hosokawa Micron

Scientz Biotechnology

PDFD

Shanghai Tianfeng Industrial

Beijing Songyuan Huaxing

Beijing Boyikang

Scientz Biotechnology

## **Key Questions Addressed in this Report**

What is the 10-year outlook for the global Freeze Dryers market?

What factors are driving Freeze Dryers market growth, globally and by region?

Which technologies are poised for the fastest growth by market and region?

How do Freeze Dryers market opportunities vary by end market size?

How does Freeze Dryers break out by Type, by Application?

## Contents

### 1 SCOPE OF THE REPORT

- 1.1 Market Introduction
- 1.2 Years Considered
- 1.3 Research Objectives
- 1.4 Market Research Methodology
- 1.5 Research Process and Data Source
- 1.6 Economic Indicators
- 1.7 Currency Considered
- 1.8 Market Estimation Caveats

### 2 EXECUTIVE SUMMARY

- 2.1 World Market Overview
  - 2.1.1 Global Freeze Dryers Annual Sales 2021-2032
  - 2.1.2 World Current & Future Analysis for Freeze Dryers by Geographic Region, 2021, 2025 & 2032
  - 2.1.3 World Current & Future Analysis for Freeze Dryers by Country/Region, 2021, 2025 & 2032
- 2.2 Freeze Dryers Segment by Type
  - 2.2.1 Lab-scale Freeze Dryers
  - 2.2.2 Pilot-scale Freeze Dryers
  - 2.2.3 Industrial-scale Freeze Dryers
  - 2.2.4 Freeze Dryers Sales by Type
    - 2.2.4.1 Global Freeze Dryers Sales Market Share by Type (2021-2026)
    - 2.2.4.2 Global Freeze Dryers Revenue and Market Share by Type (2021-2026)
    - 2.2.4.3 Global Freeze Dryers Sale Price by Type (2021-2026)
- 2.3 Freeze Dryers Segment by Technology
  - 2.3.1 Rotary Freeze Dryers
  - 2.3.2 Manifold Freeze Dryers
  - 2.3.3 Tray Freeze Dryers
  - 2.3.4 Others
  - 2.3.5 Freeze Dryers Sales by Technology
    - 2.3.5.1 Global Freeze Dryers Sales Market Share by Technology (2021-2026)
    - 2.3.5.2 Global Freeze Dryers Revenue and Market Share by Technology (2021-2026)
    - 2.3.5.3 Global Freeze Dryers Sale Price by Technology (2021-2026)
- 2.4 Freeze Dryers Segment by Style

- 2.4.1 Bench-top Freeze Dryers
- 2.4.2 Free-standing Freeze Dryers
- 2.4.3 Freeze Dryers Sales by Style
  - 2.4.3.1 Global Freeze Dryers Sales Market Share by Style (2021-2026)
  - 2.4.3.2 Global Freeze Dryers Revenue and Market Share by Style (2021-2026)
  - 2.4.3.3 Global Freeze Dryers Sale Price by Style (2021-2026)
- 2.5 Freeze Dryers Segment by Application
  - 2.5.1 Pharmaceutical
  - 2.5.2 Food Processing Industry
  - 2.5.3 Biotechnology and Environment
  - 2.5.4 Scientific Research
  - 2.5.5 Others
  - 2.5.6 Freeze Dryers Sales by Application
    - 2.5.6.1 Global Freeze Dryers Sale Market Share by Application (2021-2026)
    - 2.5.6.2 Global Freeze Dryers Revenue and Market Share by Application (2021-2026)
    - 2.5.6.3 Global Freeze Dryers Sale Price by Application (2021-2026)

### **3 GLOBAL BY COMPANY**

- 3.1 Global Freeze Dryers Breakdown Data by Company
  - 3.1.1 Global Freeze Dryers Annual Sales by Company (2021-2026)
  - 3.1.2 Global Freeze Dryers Sales Market Share by Company (2021-2026)
- 3.2 Global Freeze Dryers Annual Revenue by Company (2021-2026)
  - 3.2.1 Global Freeze Dryers Revenue by Company (2021-2026)
  - 3.2.2 Global Freeze Dryers Revenue Market Share by Company (2021-2026)
- 3.3 Global Freeze Dryers Sale Price by Company
- 3.4 Key Manufacturers Freeze Dryers Producing Area Distribution, Sales Area, Product Type
  - 3.4.1 Key Manufacturers Freeze Dryers Product Location Distribution
  - 3.4.2 Players Freeze Dryers Products Offered
- 3.5 Market Concentration Rate Analysis
  - 3.5.1 Competition Landscape Analysis
  - 3.5.2 Concentration Ratio (CR3, CR5 and CR10) & (2024-2026)
- 3.6 New Products and Potential Entrants
- 3.7 Market M&A Activity & Strategy

### **4 WORLD HISTORIC REVIEW FOR FREEZE DRYERS BY GEOGRAPHIC REGION**

- 4.1 World Historic Freeze Dryers Market Size by Geographic Region (2021-2026)

- 4.1.1 Global Freeze Dryers Annual Sales by Geographic Region (2021-2026)
- 4.1.2 Global Freeze Dryers Annual Revenue by Geographic Region (2021-2026)
- 4.2 World Historic Freeze Dryers Market Size by Country/Region (2021-2026)
  - 4.2.1 Global Freeze Dryers Annual Sales by Country/Region (2021-2026)
  - 4.2.2 Global Freeze Dryers Annual Revenue by Country/Region (2021-2026)
- 4.3 Americas Freeze Dryers Sales Growth
- 4.4 APAC Freeze Dryers Sales Growth
- 4.5 Europe Freeze Dryers Sales Growth
- 4.6 Middle East & Africa Freeze Dryers Sales Growth

## **5 AMERICAS**

- 5.1 Americas Freeze Dryers Sales by Country
  - 5.1.1 Americas Freeze Dryers Sales by Country (2021-2026)
  - 5.1.2 Americas Freeze Dryers Revenue by Country (2021-2026)
- 5.2 Americas Freeze Dryers Sales by Type (2021-2026)
- 5.3 Americas Freeze Dryers Sales by Application (2021-2026)
- 5.4 United States
- 5.5 Canada
- 5.6 Mexico
- 5.7 Brazil

## **6 APAC**

- 6.1 APAC Freeze Dryers Sales by Region
  - 6.1.1 APAC Freeze Dryers Sales by Region (2021-2026)
  - 6.1.2 APAC Freeze Dryers Revenue by Region (2021-2026)
- 6.2 APAC Freeze Dryers Sales by Type (2021-2026)
- 6.3 APAC Freeze Dryers Sales by Application (2021-2026)
- 6.4 China
- 6.5 Japan
- 6.6 South Korea
- 6.7 Southeast Asia
- 6.8 India
- 6.9 Australia
- 6.10 China Taiwan

## **7 EUROPE**

## 7.1 Europe Freeze Dryers by Country

7.1.1 Europe Freeze Dryers Sales by Country (2021-2026)

7.1.2 Europe Freeze Dryers Revenue by Country (2021-2026)

## 7.2 Europe Freeze Dryers Sales by Type (2021-2026)

## 7.3 Europe Freeze Dryers Sales by Application (2021-2026)

## 7.4 Germany

## 7.5 France

## 7.6 UK

## 7.7 Italy

## 7.8 Russia

# 8 MIDDLE EAST & AFRICA

## 8.1 Middle East & Africa Freeze Dryers by Country

8.1.1 Middle East & Africa Freeze Dryers Sales by Country (2021-2026)

8.1.2 Middle East & Africa Freeze Dryers Revenue by Country (2021-2026)

## 8.2 Middle East & Africa Freeze Dryers Sales by Type (2021-2026)

## 8.3 Middle East & Africa Freeze Dryers Sales by Application (2021-2026)

## 8.4 Egypt

## 8.5 South Africa

## 8.6 Israel

## 8.7 Turkey

## 8.8 GCC Countries

# 9 MARKET DRIVERS, CHALLENGES AND TRENDS

## 9.1 Market Drivers & Growth Opportunities

## 9.2 Market Challenges & Risks

## 9.3 Industry Trends

# 10 MANUFACTURING COST STRUCTURE ANALYSIS

## 10.1 Raw Material and Suppliers

## 10.2 Manufacturing Cost Structure Analysis of Freeze Dryers

## 10.3 Manufacturing Process Analysis of Freeze Dryers

## 10.4 Industry Chain Structure of Freeze Dryers

# 11 MARKETING, DISTRIBUTORS AND CUSTOMER

## 11.1 Sales Channel

### 11.1.1 Direct Channels

### 11.1.2 Indirect Channels

## 11.2 Freeze Dryers Distributors

## 11.3 Freeze Dryers Customer

# **12 WORLD FORECAST REVIEW FOR FREEZE DRYERS BY GEOGRAPHIC REGION**

## 12.1 Global Freeze Dryers Market Size Forecast by Region

### 12.1.1 Global Freeze Dryers Forecast by Region (2027-2032)

### 12.1.2 Global Freeze Dryers Annual Revenue Forecast by Region (2027-2032)

## 12.2 Americas Forecast by Country (2027-2032)

## 12.3 APAC Forecast by Region (2027-2032)

## 12.4 Europe Forecast by Country (2027-2032)

## 12.5 Middle East & Africa Forecast by Country (2027-2032)

## 12.6 Global Freeze Dryers Forecast by Type (2027-2032)

## 12.7 Global Freeze Dryers Forecast by Application (2027-2032)

# **13 KEY PLAYERS ANALYSIS**

## 13.1 GEA

### 13.1.1 GEA Company Information

### 13.1.2 GEA Freeze Dryers Product Portfolios and Specifications

### 13.1.3 GEA Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

### 13.1.4 GEA Main Business Overview

### 13.1.5 GEA Latest Developments

## 13.2 Tofflon

### 13.2.1 Tofflon Company Information

### 13.2.2 Tofflon Freeze Dryers Product Portfolios and Specifications

### 13.2.3 Tofflon Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

### 13.2.4 Tofflon Main Business Overview

### 13.2.5 Tofflon Latest Developments

## 13.3 IMA

### 13.3.1 IMA Company Information

### 13.3.2 IMA Freeze Dryers Product Portfolios and Specifications

### 13.3.3 IMA Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

### 13.3.4 IMA Main Business Overview

### 13.3.5 IMA Latest Developments

## 13.4 Azbil Telstar

### 13.4.1 Azbil Telstar Company Information

### 13.4.2 Azbil Telstar Freeze Dryers Product Portfolios and Specifications

### 13.4.3 Azbil Telstar Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

### 13.4.4 Azbil Telstar Main Business Overview

### 13.4.5 Azbil Telstar Latest Developments

## 13.5 OPTIMA

### 13.5.1 OPTIMA Company Information

### 13.5.2 OPTIMA Freeze Dryers Product Portfolios and Specifications

### 13.5.3 OPTIMA Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

### 13.5.4 OPTIMA Main Business Overview

### 13.5.5 OPTIMA Latest Developments

## 13.6 KYOWAC (Nissei)

### 13.6.1 KYOWAC (Nissei) Company Information

### 13.6.2 KYOWAC (Nissei) Freeze Dryers Product Portfolios and Specifications

### 13.6.3 KYOWAC (Nissei) Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

### 13.6.4 KYOWAC (Nissei) Main Business Overview

### 13.6.5 KYOWAC (Nissei) Latest Developments

## 13.7 SP Industries (ATS)

### 13.7.1 SP Industries (ATS) Company Information

### 13.7.2 SP Industries (ATS) Freeze Dryers Product Portfolios and Specifications

### 13.7.3 SP Industries (ATS) Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

### 13.7.4 SP Industries (ATS) Main Business Overview

### 13.7.5 SP Industries (ATS) Latest Developments

## 13.8 Labconco

### 13.8.1 Labconco Company Information

### 13.8.2 Labconco Freeze Dryers Product Portfolios and Specifications

### 13.8.3 Labconco Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

### 13.8.4 Labconco Main Business Overview

### 13.8.5 Labconco Latest Developments

## 13.9 HOF Sonderanlagenbau GmbH

### 13.9.1 HOF Sonderanlagenbau GmbH Company Information

### 13.9.2 HOF Sonderanlagenbau GmbH Freeze Dryers Product Portfolios and Specifications

### 13.9.3 HOF Sonderanlagenbau GmbH Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

- 13.9.4 HOF Sonderanlagenbau GmbH Main Business Overview
- 13.9.5 HOF Sonderanlagenbau GmbH Latest Developments
- 13.10 Martin Christ
  - 13.10.1 Martin Christ Company Information
  - 13.10.2 Martin Christ Freeze Dryers Product Portfolios and Specifications
  - 13.10.3 Martin Christ Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.10.4 Martin Christ Main Business Overview
  - 13.10.5 Martin Christ Latest Developments
- 13.11 MechaTech Systems
  - 13.11.1 MechaTech Systems Company Information
  - 13.11.2 MechaTech Systems Freeze Dryers Product Portfolios and Specifications
  - 13.11.3 MechaTech Systems Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.11.4 MechaTech Systems Main Business Overview
  - 13.11.5 MechaTech Systems Latest Developments
- 13.12 Millrock Technology
  - 13.12.1 Millrock Technology Company Information
  - 13.12.2 Millrock Technology Freeze Dryers Product Portfolios and Specifications
  - 13.12.3 Millrock Technology Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.12.4 Millrock Technology Main Business Overview
  - 13.12.5 Millrock Technology Latest Developments
- 13.13 Truking Technology
  - 13.13.1 Truking Technology Company Information
  - 13.13.2 Truking Technology Freeze Dryers Product Portfolios and Specifications
  - 13.13.3 Truking Technology Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.13.4 Truking Technology Main Business Overview
  - 13.13.5 Truking Technology Latest Developments
- 13.14 ilShinBioBase
  - 13.14.1 ilShinBioBase Company Information
  - 13.14.2 ilShinBioBase Freeze Dryers Product Portfolios and Specifications
  - 13.14.3 ilShinBioBase Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.14.4 ilShinBioBase Main Business Overview
  - 13.14.5 ilShinBioBase Latest Developments
- 13.15 ZIRBUS Technology
  - 13.15.1 ZIRBUS Technology Company Information

- 13.15.2 ZIRBUS Technology Freeze Dryers Product Portfolios and Specifications
- 13.15.3 ZIRBUS Technology Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
- 13.15.4 ZIRBUS Technology Main Business Overview
- 13.15.5 ZIRBUS Technology Latest Developments
- 13.16 LaboGene
  - 13.16.1 LaboGene Company Information
  - 13.16.2 LaboGene Freeze Dryers Product Portfolios and Specifications
  - 13.16.3 LaboGene Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.16.4 LaboGene Main Business Overview
  - 13.16.5 LaboGene Latest Developments
- 13.17 Cuddon Freeze Dry
  - 13.17.1 Cuddon Freeze Dry Company Information
  - 13.17.2 Cuddon Freeze Dry Freeze Dryers Product Portfolios and Specifications
  - 13.17.3 Cuddon Freeze Dry Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.17.4 Cuddon Freeze Dry Main Business Overview
  - 13.17.5 Cuddon Freeze Dry Latest Developments
- 13.18 Tokyo Rikakikai (EYELA)
  - 13.18.1 Tokyo Rikakikai (EYELA) Company Information
  - 13.18.2 Tokyo Rikakikai (EYELA) Freeze Dryers Product Portfolios and Specifications
  - 13.18.3 Tokyo Rikakikai (EYELA) Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.18.4 Tokyo Rikakikai (EYELA) Main Business Overview
  - 13.18.5 Tokyo Rikakikai (EYELA) Latest Developments
- 13.19 Freezedry Specialties, Inc.
  - 13.19.1 Freezedry Specialties, Inc. Company Information
  - 13.19.2 Freezedry Specialties, Inc. Freeze Dryers Product Portfolios and Specifications
  - 13.19.3 Freezedry Specialties, Inc. Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.19.4 Freezedry Specialties, Inc. Main Business Overview
  - 13.19.5 Freezedry Specialties, Inc. Latest Developments
- 13.20 Lyophilization Systems, Inc. (LSI)
  - 13.20.1 Lyophilization Systems, Inc. (LSI) Company Information
  - 13.20.2 Lyophilization Systems, Inc. (LSI) Freeze Dryers Product Portfolios and Specifications
  - 13.20.3 Lyophilization Systems, Inc. (LSI) Freeze Dryers Sales, Revenue, Price and

## Gross Margin (2021-2026)

13.20.4 Lyophilization Systems, Inc. (LSI) Main Business Overview

13.20.5 Lyophilization Systems, Inc. (LSI) Latest Developments

## 13.21 Vikumer Freeze Dry

13.21.1 Vikumer Freeze Dry Company Information

13.21.2 Vikumer Freeze Dry Freeze Dryers Product Portfolios and Specifications

13.21.3 Vikumer Freeze Dry Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

13.21.4 Vikumer Freeze Dry Main Business Overview

13.21.5 Vikumer Freeze Dry Latest Developments

## 13.22 Coolvacuum (Dara Pharma)

13.22.1 Coolvacuum (Dara Pharma) Company Information

13.22.2 Coolvacuum (Dara Pharma) Freeze Dryers Product Portfolios and Specifications

13.22.3 Coolvacuum (Dara Pharma) Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

13.22.4 Coolvacuum (Dara Pharma) Main Business Overview

13.22.5 Coolvacuum (Dara Pharma) Latest Developments

## 13.23 ULVAC

13.23.1 ULVAC Company Information

13.23.2 ULVAC Freeze Dryers Product Portfolios and Specifications

13.23.3 ULVAC Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

13.23.4 ULVAC Main Business Overview

13.23.5 ULVAC Latest Developments

## 13.24 RheaVita

13.24.1 RheaVita Company Information

13.24.2 RheaVita Freeze Dryers Product Portfolios and Specifications

13.24.3 RheaVita Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

13.24.4 RheaVita Main Business Overview

13.24.5 RheaVita Latest Developments

## 13.25 OPERON

13.25.1 OPERON Company Information

13.25.2 OPERON Freeze Dryers Product Portfolios and Specifications

13.25.3 OPERON Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)

13.25.4 OPERON Main Business Overview

13.25.5 OPERON Latest Developments

## 13.26 Hosokawa Micron

- 13.26.1 Hosokawa Micron Company Information
- 13.26.2 Hosokawa Micron Freeze Dryers Product Portfolios and Specifications
- 13.26.3 Hosokawa Micron Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
- 13.26.4 Hosokawa Micron Main Business Overview
- 13.26.5 Hosokawa Micron Latest Developments
- 13.27 Scientz Biotechnology
  - 13.27.1 Scientz Biotechnology Company Information
  - 13.27.2 Scientz Biotechnology Freeze Dryers Product Portfolios and Specifications
  - 13.27.3 Scientz Biotechnology Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.27.4 Scientz Biotechnology Main Business Overview
  - 13.27.5 Scientz Biotechnology Latest Developments
- 13.28 PDFD
  - 13.28.1 PDFD Company Information
  - 13.28.2 PDFD Freeze Dryers Product Portfolios and Specifications
  - 13.28.3 PDFD Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.28.4 PDFD Main Business Overview
  - 13.28.5 PDFD Latest Developments
- 13.29 Shanghai Tianfeng Industrial
  - 13.29.1 Shanghai Tianfeng Industrial Company Information
  - 13.29.2 Shanghai Tianfeng Industrial Freeze Dryers Product Portfolios and Specifications
  - 13.29.3 Shanghai Tianfeng Industrial Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.29.4 Shanghai Tianfeng Industrial Main Business Overview
  - 13.29.5 Shanghai Tianfeng Industrial Latest Developments
- 13.30 Beijing Songyuan Huaxing
  - 13.30.1 Beijing Songyuan Huaxing Company Information
  - 13.30.2 Beijing Songyuan Huaxing Freeze Dryers Product Portfolios and Specifications
  - 13.30.3 Beijing Songyuan Huaxing Freeze Dryers Sales, Revenue, Price and Gross Margin (2021-2026)
  - 13.30.4 Beijing Songyuan Huaxing Main Business Overview
  - 13.30.5 Beijing Songyuan Huaxing Latest Developments
- 13.31 Beijing Boyikang
  - 13.31.1 Beijing Boyikang Company Information
  - 13.31.2 Beijing Boyikang Freeze Dryers Product Portfolios and Specifications
  - 13.31.3 Beijing Boyikang Freeze Dryers Sales, Revenue, Price and Gross Margin

(2021-2026)

13.31.4 Beijing Boyikang Main Business Overview

13.31.5 Beijing Boyikang Latest Developments

13.32 Scientz Biotechnology

13.32.1 Scientz Biotechnology Company Information

13.32.2 Scientz Biotechnology Freeze Dryers Product Portfolios and Specifications

13.32.3 Scientz Biotechnology Freeze Dryers Sales, Revenue, Price and Gross

Margin (2021-2026)

13.32.4 Scientz Biotechnology Main Business Overview

13.32.5 Scientz Biotechnology Latest Developments

## **14 RESEARCH FINDINGS AND CONCLUSION**

## List Of Tables

### LIST OF TABLES

Table 1. Freeze Dryers Annual Sales CAGR by Geographic Region (2021, 2025 & 2032) & (\$ millions)

Table 2. Freeze Dryers Annual Sales CAGR by Country/Region (2021, 2025 & 2032) & (\$ millions)

Table 3. Major Players of Lab-scale Freeze Dryers

Table 4. Major Players of Pilot-scale Freeze Dryers

Table 5. Major Players of Industrial-scale Freeze Dryers

Table 6. Global Freeze Dryers Sales by Type (2021-2026) & (Units)

Table 7. Global Freeze Dryers Sales Market Share by Type (2021-2026)

Table 8. Global Freeze Dryers Revenue by Type (2021-2026) & (\$ million)

Table 9. Global Freeze Dryers Revenue Market Share by Type (2021-2026)

Table 10. Global Freeze Dryers Sale Price by Type (2021-2026) & (K US\$/Unit)

Table 11. Major Players of Rotary Freeze Dryers

Table 12. Major Players of Manifold Freeze Dryers

Table 13. Major Players of Tray Freeze Dryers

Table 14. Major Players of Others

Table 15. Global Freeze Dryers Sales by Technology (2021-2026) & (Units)

Table 16. Global Freeze Dryers Sales Market Share by Technology (2021-2026)

Table 17. Global Freeze Dryers Revenue by Technology (2021-2026) & (\$ million)

Table 18. Global Freeze Dryers Revenue Market Share by Technology (2021-2026)

Table 19. Global Freeze Dryers Sale Price by Technology (2021-2026) & (K US\$/Unit)

Table 20. Major Players of Bench-top Freeze Dryers

Table 21. Major Players of Free-standing Freeze Dryers

Table 22. Global Freeze Dryers Sales by Style (2021-2026) & (Units)

Table 23. Global Freeze Dryers Sales Market Share by Style (2021-2026)

Table 24. Global Freeze Dryers Revenue by Style (2021-2026) & (\$ million)

Table 25. Global Freeze Dryers Revenue Market Share by Style (2021-2026)

Table 26. Global Freeze Dryers Sale Price by Style (2021-2026) & (K US\$/Unit)

Table 27. Global Freeze Dryers Sale by Application (2021-2026) & (Units)

Table 28. Global Freeze Dryers Sale Market Share by Application (2021-2026)

Table 29. Global Freeze Dryers Revenue by Application (2021-2026) & (\$ million)

Table 30. Global Freeze Dryers Revenue Market Share by Application (2021-2026)

Table 31. Global Freeze Dryers Sale Price by Application (2021-2026) & (K US\$/Unit)

Table 32. Global Freeze Dryers Sales by Company (2021-2026) & (Units)

Table 33. Global Freeze Dryers Sales Market Share by Company (2021-2026)

|                                                                                          |
|------------------------------------------------------------------------------------------|
| Table 34. Global Freeze Dryers Revenue by Company (2021-2026) & (\$ millions)            |
| Table 35. Global Freeze Dryers Revenue Market Share by Company (2021-2026)               |
| Table 36. Global Freeze Dryers Sale Price by Company (2021-2026) & (K US\$/Unit)         |
| Table 37. Key Manufacturers Freeze Dryers Producing Area Distribution and Sales Area     |
| Table 38. Players Freeze Dryers Products Offered                                         |
| Table 39. Freeze Dryers Concentration Ratio (CR3, CR5 and CR10) & (2024-2026)            |
| Table 40. New Products and Potential Entrants                                            |
| Table 41. Market M&A Activity & Strategy                                                 |
| Table 42. Global Freeze Dryers Sales by Geographic Region (2021-2026) & (Units)          |
| Table 43. Global Freeze Dryers Sales Market Share Geographic Region (2021-2026)          |
| Table 44. Global Freeze Dryers Revenue by Geographic Region (2021-2026) & (\$ millions)  |
| Table 45. Global Freeze Dryers Revenue Market Share by Geographic Region (2021-2026)     |
| Table 46. Global Freeze Dryers Sales by Country/Region (2021-2026) & (Units)             |
| Table 47. Global Freeze Dryers Sales Market Share by Country/Region (2021-2026)          |
| Table 48. Global Freeze Dryers Revenue by Country/Region (2021-2026) & (\$ millions)     |
| Table 49. Global Freeze Dryers Revenue Market Share by Country/Region (2021-2026)        |
| Table 50. Americas Freeze Dryers Sales by Country (2021-2026) & (Units)                  |
| Table 51. Americas Freeze Dryers Sales Market Share by Country (2021-2026)               |
| Table 52. Americas Freeze Dryers Revenue by Country (2021-2026) & (\$ millions)          |
| Table 53. Americas Freeze Dryers Sales by Type (2021-2026) & (Units)                     |
| Table 54. Americas Freeze Dryers Sales by Application (2021-2026) & (Units)              |
| Table 55. APAC Freeze Dryers Sales by Region (2021-2026) & (Units)                       |
| Table 56. APAC Freeze Dryers Sales Market Share by Region (2021-2026)                    |
| Table 57. APAC Freeze Dryers Revenue by Region (2021-2026) & (\$ millions)               |
| Table 58. APAC Freeze Dryers Sales by Type (2021-2026) & (Units)                         |
| Table 59. APAC Freeze Dryers Sales by Application (2021-2026) & (Units)                  |
| Table 60. Europe Freeze Dryers Sales by Country (2021-2026) & (Units)                    |
| Table 61. Europe Freeze Dryers Revenue by Country (2021-2026) & (\$ millions)            |
| Table 62. Europe Freeze Dryers Sales by Type (2021-2026) & (Units)                       |
| Table 63. Europe Freeze Dryers Sales by Application (2021-2026) & (Units)                |
| Table 64. Middle East & Africa Freeze Dryers Sales by Country (2021-2026) & (Units)      |
| Table 65. Middle East & Africa Freeze Dryers Revenue Market Share by Country (2021-2026) |
| Table 66. Middle East & Africa Freeze Dryers Sales by Type (2021-2026) & (Units)         |
| Table 67. Middle East & Africa Freeze Dryers Sales by Application (2021-2026) & (Units)  |

|                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------|
| Table 68. Key Market Drivers & Growth Opportunities of Freeze Dryers                                                  |
| Table 69. Key Market Challenges & Risks of Freeze Dryers                                                              |
| Table 70. Key Industry Trends of Freeze Dryers                                                                        |
| Table 71. Freeze Dryers Raw Material                                                                                  |
| Table 72. Key Suppliers of Raw Materials                                                                              |
| Table 73. Freeze Dryers Distributors List                                                                             |
| Table 74. Freeze Dryers Customer List                                                                                 |
| Table 75. Global Freeze Dryers Sales Forecast by Region (2027-2032) & (Units)                                         |
| Table 76. Global Freeze Dryers Revenue Forecast by Region (2027-2032) & (\$ millions)                                 |
| Table 77. Americas Freeze Dryers Sales Forecast by Country (2027-2032) & (Units)                                      |
| Table 78. Americas Freeze Dryers Annual Revenue Forecast by Country (2027-2032) & (\$ millions)                       |
| Table 79. APAC Freeze Dryers Sales Forecast by Region (2027-2032) & (Units)                                           |
| Table 80. APAC Freeze Dryers Annual Revenue Forecast by Region (2027-2032) & (\$ millions)                            |
| Table 81. Europe Freeze Dryers Sales Forecast by Country (2027-2032) & (Units)                                        |
| Table 82. Europe Freeze Dryers Revenue Forecast by Country (2027-2032) & (\$ millions)                                |
| Table 83. Middle East & Africa Freeze Dryers Sales Forecast by Country (2027-2032) & (Units)                          |
| Table 84. Middle East & Africa Freeze Dryers Revenue Forecast by Country (2027-2032) & (\$ millions)                  |
| Table 85. Global Freeze Dryers Sales Forecast by Type (2027-2032) & (Units)                                           |
| Table 86. Global Freeze Dryers Revenue Forecast by Type (2027-2032) & (\$ millions)                                   |
| Table 87. Global Freeze Dryers Sales Forecast by Application (2027-2032) & (Units)                                    |
| Table 88. Global Freeze Dryers Revenue Forecast by Application (2027-2032) & (\$ millions)                            |
| Table 89. GEA Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                     |
| Table 90. GEA Freeze Dryers Product Portfolios and Specifications                                                     |
| Table 91. GEA Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)     |
| Table 92. GEA Main Business                                                                                           |
| Table 93. GEA Latest Developments                                                                                     |
| Table 94. Tofflon Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                 |
| Table 95. Tofflon Freeze Dryers Product Portfolios and Specifications                                                 |
| Table 96. Tofflon Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026) |

Table 97. Tofflon Main Business

Table 98. Tofflon Latest Developments

Table 99. IMA Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 100. IMA Freeze Dryers Product Portfolios and Specifications

Table 101. IMA Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 102. IMA Main Business

Table 103. IMA Latest Developments

Table 104. Azbil Telstar Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 105. Azbil Telstar Freeze Dryers Product Portfolios and Specifications

Table 106. Azbil Telstar Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 107. Azbil Telstar Main Business

Table 108. Azbil Telstar Latest Developments

Table 109. OPTIMA Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 110. OPTIMA Freeze Dryers Product Portfolios and Specifications

Table 111. OPTIMA Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 112. OPTIMA Main Business

Table 113. OPTIMA Latest Developments

Table 114. KYOWAC (Nissei) Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 115. KYOWAC (Nissei) Freeze Dryers Product Portfolios and Specifications

Table 116. KYOWAC (Nissei) Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 117. KYOWAC (Nissei) Main Business

Table 118. KYOWAC (Nissei) Latest Developments

Table 119. SP Industries (ATS) Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 120. SP Industries (ATS) Freeze Dryers Product Portfolios and Specifications

Table 121. SP Industries (ATS) Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 122. SP Industries (ATS) Main Business

Table 123. SP Industries (ATS) Latest Developments

Table 124. Labconco Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

|                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------|
| Table 125. Labconco Freeze Dryers Product Portfolios and Specifications                                                                  |
| Table 126. Labconco Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)                  |
| Table 127. Labconco Main Business                                                                                                        |
| Table 128. Labconco Latest Developments                                                                                                  |
| Table 129. HOF Sonderanlagenbau GmbH Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                 |
| Table 130. HOF Sonderanlagenbau GmbH Freeze Dryers Product Portfolios and Specifications                                                 |
| Table 131. HOF Sonderanlagenbau GmbH Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026) |
| Table 132. HOF Sonderanlagenbau GmbH Main Business                                                                                       |
| Table 133. HOF Sonderanlagenbau GmbH Latest Developments                                                                                 |
| Table 134. Martin Christ Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                             |
| Table 135. Martin Christ Freeze Dryers Product Portfolios and Specifications                                                             |
| Table 136. Martin Christ Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)             |
| Table 137. Martin Christ Main Business                                                                                                   |
| Table 138. Martin Christ Latest Developments                                                                                             |
| Table 139. MechaTech Systems Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                         |
| Table 140. MechaTech Systems Freeze Dryers Product Portfolios and Specifications                                                         |
| Table 141. MechaTech Systems Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)         |
| Table 142. MechaTech Systems Main Business                                                                                               |
| Table 143. MechaTech Systems Latest Developments                                                                                         |
| Table 144. Millrock Technology Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                       |
| Table 145. Millrock Technology Freeze Dryers Product Portfolios and Specifications                                                       |
| Table 146. Millrock Technology Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)       |
| Table 147. Millrock Technology Main Business                                                                                             |
| Table 148. Millrock Technology Latest Developments                                                                                       |
| Table 149. Truking Technology Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                        |
| Table 150. Truking Technology Freeze Dryers Product Portfolios and Specifications                                                        |
| Table 151. Truking Technology Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)        |

Table 152. Truking Technology Main Business

Table 153. Truking Technology Latest Developments

Table 154. ilShinBioBase Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 155. ilShinBioBase Freeze Dryers Product Portfolios and Specifications

Table 156. ilShinBioBase Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 157. ilShinBioBase Main Business

Table 158. ilShinBioBase Latest Developments

Table 159. ZIRBUS Technology Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 160. ZIRBUS Technology Freeze Dryers Product Portfolios and Specifications

Table 161. ZIRBUS Technology Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 162. ZIRBUS Technology Main Business

Table 163. ZIRBUS Technology Latest Developments

Table 164. LaboGene Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 165. LaboGene Freeze Dryers Product Portfolios and Specifications

Table 166. LaboGene Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 167. LaboGene Main Business

Table 168. LaboGene Latest Developments

Table 169. Cuddon Freeze Dry Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 170. Cuddon Freeze Dry Freeze Dryers Product Portfolios and Specifications

Table 171. Cuddon Freeze Dry Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 172. Cuddon Freeze Dry Main Business

Table 173. Cuddon Freeze Dry Latest Developments

Table 174. Tokyo Rikakikai (EYELA) Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 175. Tokyo Rikakikai (EYELA) Freeze Dryers Product Portfolios and Specifications

Table 176. Tokyo Rikakikai (EYELA) Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 177. Tokyo Rikakikai (EYELA) Main Business

Table 178. Tokyo Rikakikai (EYELA) Latest Developments

Table 179. Freezedry Specialties, Inc. Basic Information, Freeze Dryers Manufacturing

Base, Sales Area and Its Competitors

Table 180. Freezedry Specialties, Inc. Freeze Dryers Product Portfolios and Specifications

Table 181. Freezedry Specialties, Inc. Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 182. Freezedry Specialties, Inc. Main Business

Table 183. Freezedry Specialties, Inc. Latest Developments

Table 184. Lyophilization Systems, Inc. (LSI) Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 185. Lyophilization Systems, Inc. (LSI) Freeze Dryers Product Portfolios and Specifications

Table 186. Lyophilization Systems, Inc. (LSI) Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 187. Lyophilization Systems, Inc. (LSI) Main Business

Table 188. Lyophilization Systems, Inc. (LSI) Latest Developments

Table 189. Vikumer Freeze Dry Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 190. Vikumer Freeze Dry Freeze Dryers Product Portfolios and Specifications

Table 191. Vikumer Freeze Dry Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 192. Vikumer Freeze Dry Main Business

Table 193. Vikumer Freeze Dry Latest Developments

Table 194. Coolvacuum (Dara Pharma) Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 195. Coolvacuum (Dara Pharma) Freeze Dryers Product Portfolios and Specifications

Table 196. Coolvacuum (Dara Pharma) Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 197. Coolvacuum (Dara Pharma) Main Business

Table 198. Coolvacuum (Dara Pharma) Latest Developments

Table 199. ULVAC Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

Table 200. ULVAC Freeze Dryers Product Portfolios and Specifications

Table 201. ULVAC Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)

Table 202. ULVAC Main Business

Table 203. ULVAC Latest Developments

Table 204. RheaVita Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors

|                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------|
| Table 205. RheaVita Freeze Dryers Product Portfolios and Specifications                                                                     |
| Table 206. RheaVita Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)                     |
| Table 207. RheaVita Main Business                                                                                                           |
| Table 208. RheaVita Latest Developments                                                                                                     |
| Table 209. OPERON Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                                       |
| Table 210. OPERON Freeze Dryers Product Portfolios and Specifications                                                                       |
| Table 211. OPERON Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)                       |
| Table 212. OPERON Main Business                                                                                                             |
| Table 213. OPERON Latest Developments                                                                                                       |
| Table 214. Hosokawa Micron Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                              |
| Table 215. Hosokawa Micron Freeze Dryers Product Portfolios and Specifications                                                              |
| Table 216. Hosokawa Micron Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)              |
| Table 217. Hosokawa Micron Main Business                                                                                                    |
| Table 218. Hosokawa Micron Latest Developments                                                                                              |
| Table 219. Scientz Biotechnology Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                        |
| Table 220. Scientz Biotechnology Freeze Dryers Product Portfolios and Specifications                                                        |
| Table 221. Scientz Biotechnology Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)        |
| Table 222. Scientz Biotechnology Main Business                                                                                              |
| Table 223. Scientz Biotechnology Latest Developments                                                                                        |
| Table 224. PDFD Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                                         |
| Table 225. PDFD Freeze Dryers Product Portfolios and Specifications                                                                         |
| Table 226. PDFD Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)                         |
| Table 227. PDFD Main Business                                                                                                               |
| Table 228. PDFD Latest Developments                                                                                                         |
| Table 229. Shanghai Tianfeng Industrial Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                 |
| Table 230. Shanghai Tianfeng Industrial Freeze Dryers Product Portfolios and Specifications                                                 |
| Table 231. Shanghai Tianfeng Industrial Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026) |

|                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------|
| Table 232. Shanghai Tianfeng Industrial Main Business                                                                                   |
| Table 233. Shanghai Tianfeng Industrial Latest Developments                                                                             |
| Table 234. Beijing Songyuan Huaxing Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                 |
| Table 235. Beijing Songyuan Huaxing Freeze Dryers Product Portfolios and Specifications                                                 |
| Table 236. Beijing Songyuan Huaxing Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026) |
| Table 237. Beijing Songyuan Huaxing Main Business                                                                                       |
| Table 238. Beijing Songyuan Huaxing Latest Developments                                                                                 |
| Table 239. Beijing Boyikang Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                         |
| Table 240. Beijing Boyikang Freeze Dryers Product Portfolios and Specifications                                                         |
| Table 241. Beijing Boyikang Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)         |
| Table 242. Beijing Boyikang Main Business                                                                                               |
| Table 243. Beijing Boyikang Latest Developments                                                                                         |
| Table 244. Scientz Biotechnology Basic Information, Freeze Dryers Manufacturing Base, Sales Area and Its Competitors                    |
| Table 245. Scientz Biotechnology Freeze Dryers Product Portfolios and Specifications                                                    |
| Table 246. Scientz Biotechnology Freeze Dryers Sales (Units), Revenue (\$ Million), Price (K US\$/Unit) and Gross Margin (2021-2026)    |
| Table 247. Scientz Biotechnology Main Business                                                                                          |
| Table 248. Scientz Biotechnology Latest Developments                                                                                    |

## List Of Figures

### LIST OF FIGURES

- Figure 1. Picture of Freeze Dryers
- Figure 2. Freeze Dryers Report Years Considered
- Figure 3. Research Objectives
- Figure 4. Research Methodology
- Figure 5. Research Process and Data Source
- Figure 6. Global Freeze Dryers Sales Growth Rate 2021-2032 (Units)
- Figure 7. Global Freeze Dryers Revenue Growth Rate 2021-2032 (\$ millions)
- Figure 8. Freeze Dryers Sales by Geographic Region (2021, 2025 & 2032) & (\$ millions)
- Figure 9. Freeze Dryers Sales Market Share by Country/Region (2025)
- Figure 10. Freeze Dryers Sales Market Share by Country/Region (2021, 2025 & 2032)
- Figure 11. Product Picture of Lab-scale Freeze Dryers
- Figure 12. Product Picture of Pilot-scale Freeze Dryers
- Figure 13. Product Picture of Industrial-scale Freeze Dryers
- Figure 14. Global Freeze Dryers Sales Market Share by Type in 2026
- Figure 15. Global Freeze Dryers Revenue Market Share by Type (2021-2026)
- Figure 16. Product Picture of Rotary Freeze Dryers
- Figure 17. Product Picture of Manifold Freeze Dryers
- Figure 18. Product Picture of Tray Freeze Dryers
- Figure 19. Product Picture of Others
- Figure 20. Global Freeze Dryers Sales Market Share by Technology in 2026
- Figure 21. Global Freeze Dryers Revenue Market Share by Technology (2021-2026)
- Figure 22. Product Picture of Bench-top Freeze Dryers
- Figure 23. Product Picture of Free-standing Freeze Dryers
- Figure 24. Global Freeze Dryers Sales Market Share by Style in 2026
- Figure 25. Global Freeze Dryers Revenue Market Share by Style (2021-2026)
- Figure 26. Freeze Dryers Consumed in Pharmaceutical
- Figure 27. Global Freeze Dryers Market: Pharmaceutical (2021-2026) & (Units)
- Figure 28. Freeze Dryers Consumed in Food Processing Industry
- Figure 29. Global Freeze Dryers Market: Food Processing Industry (2021-2026) & (Units)
- Figure 30. Freeze Dryers Consumed in Biotechnology and Environment
- Figure 31. Global Freeze Dryers Market: Biotechnology and Environment (2021-2026) & (Units)
- Figure 32. Freeze Dryers Consumed in Scientific Research

Figure 33. Global Freeze Dryers Market: Scientific Research (2021-2026) & (Units)

Figure 34. Freeze Dryers Consumed in Others

Figure 35. Global Freeze Dryers Market: Others (2021-2026) & (Units)

Figure 36. Global Freeze Dryers Sale Market Share by Application (2025)

Figure 37. Global Freeze Dryers Revenue Market Share by Application in 2025

Figure 38. Freeze Dryers Sales by Company in 2025 (Units)

Figure 39. Global Freeze Dryers Sales Market Share by Company in 2025

Figure 40. Freeze Dryers Revenue by Company in 2025 (\$ millions)

Figure 41. Global Freeze Dryers Revenue Market Share by Company in 2025

Figure 42. Global Freeze Dryers Sales Market Share by Geographic Region (2021-2026)

Figure 43. Global Freeze Dryers Revenue Market Share by Geographic Region in 2025

Figure 44. Americas Freeze Dryers Sales 2021-2026 (Units)

Figure 45. Americas Freeze Dryers Revenue 2021-2026 (\$ millions)

Figure 46. APAC Freeze Dryers Sales 2021-2026 (Units)

Figure 47. APAC Freeze Dryers Revenue 2021-2026 (\$ millions)

Figure 48. Europe Freeze Dryers Sales 2021-2026 (Units)

Figure 49. Europe Freeze Dryers Revenue 2021-2026 (\$ millions)

Figure 50. Middle East & Africa Freeze Dryers Sales 2021-2026 (Units)

Figure 51. Middle East & Africa Freeze Dryers Revenue 2021-2026 (\$ millions)

Figure 52. Americas Freeze Dryers Sales Market Share by Country in 2025

Figure 53. Americas Freeze Dryers Revenue Market Share by Country (2021-2026)

Figure 54. Americas Freeze Dryers Sales Market Share by Type (2021-2026)

Figure 55. Americas Freeze Dryers Sales Market Share by Application (2021-2026)

Figure 56. United States Freeze Dryers Revenue Growth 2021-2026 (\$ millions)

Figure 57. Canada Freeze Dryers Revenue Growth 2021-2026 (\$ millions)

Figure 58. Mexico Freeze Dryers Revenue Growth 2021-2026 (\$ millions)

Figure 59. Brazil Freeze Dryers Revenue Growth 2021-2026 (\$ millions)

Figure 60. APAC Freeze Dryers Sales Market Share by Region in 2025

Figure 61. APAC Freeze Dryers Revenue Market Share by Region (2021-2026)

Figure 62. APAC Freeze Dryers Sales Market Share by Type (2021-2026)

Figure 63. APAC Freeze Dryers Sales Market Share by Application (2021-2026)

Figure 64. China Freeze Dryers Revenue Growth 2021-2026 (\$ millions)

Figure 65. Japan Freeze Dryers Revenue Growth 2021-2026 (\$ millions)

Figure 66. South Korea Freeze Dryers Revenue Growth 2021-2026 (\$ millions)

Figure 67. Southeast Asia Freeze Dryers Revenue Growth 2021-2026 (\$ millions)

Figure 68. India Freeze Dryers Revenue Growth 2021-2026 (\$ millions)

Figure 69. Australia Freeze Dryers Revenue Growth 2021-2026 (\$ millions)

Figure 70. China Taiwan Freeze Dryers Revenue Growth 2021-2026 (\$ millions)

- Figure 71. Europe Freeze Dryers Sales Market Share by Country in 2025
- Figure 72. Europe Freeze Dryers Revenue Market Share by Country (2021-2026)
- Figure 73. Europe Freeze Dryers Sales Market Share by Type (2021-2026)
- Figure 74. Europe Freeze Dryers Sales Market Share by Application (2021-2026)
- Figure 75. Germany Freeze Dryers Revenue Growth 2021-2026 (\$ millions)
- Figure 76. France Freeze Dryers Revenue Growth 2021-2026 (\$ millions)
- Figure 77. UK Freeze Dryers Revenue Growth 2021-2026 (\$ millions)
- Figure 78. Italy Freeze Dryers Revenue Growth 2021-2026 (\$ millions)
- Figure 79. Russia Freeze Dryers Revenue Growth 2021-2026 (\$ millions)
- Figure 80. Middle East & Africa Freeze Dryers Sales Market Share by Country (2021-2026)
- Figure 81. Middle East & Africa Freeze Dryers Sales Market Share by Type (2021-2026)
- Figure 82. Middle East & Africa Freeze Dryers Sales Market Share by Application (2021-2026)
- Figure 83. Egypt Freeze Dryers Revenue Growth 2021-2026 (\$ millions)
- Figure 84. South Africa Freeze Dryers Revenue Growth 2021-2026 (\$ millions)
- Figure 85. Israel Freeze Dryers Revenue Growth 2021-2026 (\$ millions)
- Figure 86. Turkey Freeze Dryers Revenue Growth 2021-2026 (\$ millions)
- Figure 87. GCC Countries Freeze Dryers Revenue Growth 2021-2026 (\$ millions)
- Figure 88. Manufacturing Cost Structure Analysis of Freeze Dryers in 2026
- Figure 89. Manufacturing Process Analysis of Freeze Dryers
- Figure 90. Industry Chain Structure of Freeze Dryers
- Figure 91. Channels of Distribution
- Figure 92. Global Freeze Dryers Sales Market Forecast by Region (2027-2032)
- Figure 93. Global Freeze Dryers Revenue Market Share Forecast by Region (2027-2032)
- Figure 94. Global Freeze Dryers Sales Market Share Forecast by Type (2027-2032)
- Figure 95. Global Freeze Dryers Revenue Market Share Forecast by Type (2027-2032)
- Figure 96. Global Freeze Dryers Sales Market Share Forecast by Application (2027-2032)
- Figure 97. Global Freeze Dryers Revenue Market Share Forecast by Application (2027-2032)

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