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Cryogenic Valve Assembly Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Type of Valve (Globe Valves, Gate Valves, Ball Valves, Butterfly Valves, Check Valves, Others), By Application (Liquefied Natural Gas (LNG), Industrial Gases, Petrochemical & Chemical Processing, Food & Beverage, Medical & Healthcare, Aerospace & Defense, Others), By Cryogenic Medium (Liquid Nitrogen, Liquid Oxygen, Liquid Argon, Liquefied Natural Gas (LNG), Liquid Hydrogen, Others), By Region & Competition, 2020-2030F

https://marketpublishers.com/r/CE7B4E128FD2EN.html
Date: June 2025
Pages: 185
Price: US$ 4,500.00 (Single User License)
ID: CE7B4E128FD2EN

Abstracts

Market Overview

The Global Cryogenic Valve Assembly Market was valued at USD 4.28 Billion in 2024 and is projected to reach USD 6.89 Billion by 2030, growing at a CAGR of 8.09% during the forecast period. This growth is being driven by increasing demand for cryogenic systems across key industries such as energy, healthcare, chemicals, and food processing. Cryogenic valve assemblies are specifically engineered to function under extremely low temperatures and high-pressure environments, making them essential for handling liquefied gases such as LNG, liquid nitrogen, oxygen, hydrogen, and argon. These valves ensure safety, control, and operational stability in critical cryogenic operations. The global surge in LNG trade, especially across Asia-Pacific, North America, and the Middle East, is significantly contributing to market expansion, as nations ramp up LNG import-export infrastructure. Additionally, the growing focus on

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hydrogen-based energy, particularly in Europe and Asia, is leading to increased investment in cryogenic storage and transport systems. This shift toward cleaner fuels and the rising deployment of cryogenic facilities are expected to sustain the demand for advanced valve assemblies worldwide.

Key Market Drivers

Rising Global LNG Trade and Infrastructure Development

The accelerating global trade in liquefied natural gas (LNG) is a primary driver for the cryogenic valve assembly market. As countries seek cleaner energy alternatives, LNG continues to gain traction due to its lower emissions compared to conventional fossil fuels. This transition is spurring the development of LNG infrastructure—including liquefaction plants, regasification terminals, and LNG-fueled shipping vessels—each requiring precise cryogenic valve systems.

In 2023, global LNG trade reached 405 million tonnes, and over 70% of LNG infrastructure projects under construction involve cryogenic fluid handling. China alone imported over 71 million tonnes of LNG, reflecting growing reliance on cryogenic systems. Additionally, more than 350 LNG-powered vessels are currently in operation, expanding the scope for onboard valve applications.

Cryogenic valve assemblies play a critical role across all stages of the LNG value chain, supporting fluid control, containment, and safety. With liquefaction capacity projected to grow substantially by 2027, demand for reliable and high-performance valves is set to rise in tandem with infrastructure expansion globally.

Key Market Challenges

High Cost of Manufacturing and Material Requirements

One of the major challenges impeding widespread adoption of cryogenic valve assemblies is the high cost of production. These valves must withstand extremely low temperatures—often below -196°C—and require durable materials such as Inconel, Monel, Hastelloy, and stainless steel, which are significantly costlier than standard materials.

Furthermore, advanced features such as extended bonnets, vacuum insulation, and high-tolerance machining increase manufacturing complexity and cost. Custom

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engineering requirements based on specific fluids and operating conditions further limit economies of scale.

Compliance with international safety and quality standards also adds to the overall cost burden, particularly for smaller manufacturers. Certification requirements like API 607, ASME B16.34, and Iso 21013 demand rigorous testing and documentation, contributing to longer lead times and increased expenses.

In cost-sensitive or emerging markets, the high total cost of ownership presents a barrier, with buyers sometimes opting for lower-cost alternatives that may not offer equivalent performance or safety standards.

Key Market Trends

Increasing Adoption of Hydrogen Infrastructure Worldwide

The global momentum behind hydrogen as a clean fuel alternative is catalyzing demand for specialized cryogenic valve assemblies. Since hydrogen liquefies at -253°C, high-performance cryogenic valves are essential for safe and effective handling, particularly in applications involving fuel cell vehicles, green hydrogen plants, and refueling infrastructure.

Governments across Europe, Asia, and North America are accelerating investments in hydrogen ecosystems. The EU plans to produce 10 million tonnes of renewable hydrogen by 2030, prompting development of cryogenic-compatible infrastructure including storage, pipelines, and transport units.

Hydrogen’s molecular properties require specially designed valves to address issues like leakage, embrittlement, and pressure instability. In response, manufacturers are innovating with advanced alloys and low-expansion sealing technologies.

Ongoing projects such as HyDeploy in the UK, H2 Mobility in Germany, and India’s National Hydrogen Mission are expanding the market for cryogenic valve assemblies tailored for hydrogen environments, marking a pivotal trend in the transition to clean energy.

Key Market Players

Emerson Electric Co.

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Parker Hannifin Corporation

Flowserve Corporation

Linde plc

Velan Inc.

Herose GmbH

Weir Group PLC

Habonim Industrial Valves & Actuators Ltd.

KITZ Corporation

Cryostar SAS

Report Scope:

In this report, the Global Cryogenic Valve Assembly Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Cryogenic Valve Assembly Market, By Type of Valve:

Globe Valves

Gate Valves

Ball Valves

Butterfly Valves

Check Valves

Others

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Cryogenic Valve Assembly Market, By Application:

- Liquefied Natural Gas (LNG)
- Industrial Gases
- Petrochemical & Chemical Processing
- Food & Beverage
- Medical & Healthcare
- Aerospace & Defense
- Others

Cryogenic Valve Assembly Market, By Cryogenic Medium:

- Liquid Nitrogen
- Liquid Oxygen
- Liquid Argon
- Liquefied Natural Gas (LNG)
- Liquid Hydrogen
- Others

Cryogenic Valve Assembly Market, By Region:

- North America
  - United States
  - Canada

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- Mexico

Europe

- Germany
- France
- United Kingdom
- Italy
- Spain

South America

- Brazil
- Argentina
- Colombia

Asia-Pacific

- China
- India
- Japan
- South Korea
- Australia

Middle East & Africa

- Saudi Arabia
- UAE

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South Africa

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Cryogenic Valve Assembly Market.

Available Customizations:

Global Cryogenic Valve Assembly Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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