

Cryocooler Global Market Insights 2025, Analysis and Forecast to 2030, by Manufacturers, Regions, Technology, Application

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Abstracts

Cryocooler Market Summary

Introduction

Cryocoolers are refrigeration systems designed to achieve ultra-low temperatures for applications in healthcare, power and energy, research and development, military and defense, aerospace, and other sectors. These devices are critical for cooling superconducting magnets, infrared detectors, and quantum computing systems, offering high reliability and efficiency. The industry is characterized by its role in advanced technologies, driven by demand for quantum computing, medical imaging, and clean energy solutions. Key trends include the development of compact, energy-efficient cryocoolers and advancements in pulse-tube and Stirling technologies. The market is propelled by global investments in quantum technologies and aerospace, particularly in North America and Asia Pacific.

Market Size and Growth Forecast

The global Cryocooler market was valued at USD 2.3–4.2 billion in 2024, with an estimated CAGR of 5.5%–7.5% from 2025 to 2030, driven by demand in quantum computing and healthcare.

Regional Analysis

North America is projected to grow at a CAGR of 5.3%–7.3%, with the U.S. leading due to its quantum computing and aerospace sectors, focusing on high-efficiency

cryocoolers.

Europe is expected to achieve a CAGR of 5.0%–7.0%, with the UK driving demand through research and defense applications, emphasizing compact systems.

Asia Pacific is anticipated to record the highest growth at 5.8%–7.8%, led by Japan and China, where quantum technology and energy applications fuel demand, with trends toward scalable cryocoolers.

Rest of the World, particularly Israel, is expected to grow at 4.8%–6.8%, with trends toward military applications.

Application Analysis

Healthcare applications are estimated to grow at a CAGR of 5.5%–7.5%, driven by MRI and cryosurgery, with trends toward compact cryocoolers.

Power and energy applications are projected to expand at 5.3%–7.3%, supported by hydrogen storage, with innovations in energy-efficient systems.

Research and development applications are expected to grow at 5.8%–7.8%, focusing on quantum computing, with advancements in sub-Kelvin cooling.

Military and defense, aerospace, and other applications are projected to grow at 5.0%–7.0%, with trends toward ruggedized cryocoolers.

Key Market Players

Sumitomo Heavy Industries, headquartered in Tokyo, Japan, produces cryocoolers for healthcare and energy applications, known for its advanced refrigeration technologies.

AMETEK, based in Berwyn, Pennsylvania, USA, offers cryocoolers for aerospace, emphasizing high-reliability systems.

ULVAC, headquartered in Chigasaki, Japan, provides cryocoolers for research applications, focusing on scalable cooling solutions.

Porter's Five Forces Analysis

The threat of new entrants is low; high R&D costs and technical expertise create barriers.

The threat of substitutes is moderate; alternative cooling methods compete, but cryocoolers' precision maintains their edge.

Buyer power is moderate; specialized applications limit leverage, but large buyers negotiate pricing.

Supplier power is low; components are available, reducing supplier influence.

Competitive rivalry is high; players differentiate through energy efficiency and compact designs.

Market Opportunities and Challenges

Opportunities

Growth in quantum computing drives demand for advanced cryocoolers.

Expansion of clean energy applications enhances market potential.

Emerging markets in Asia Pacific offer growth due to technological investments.

Challenges

High costs for advanced cryocoolers limit adoption.

Regulatory scrutiny on energy consumption increases compliance costs.

Technical complexity requires skilled operators.

Growth Trend Analysis

The Cryocooler market is growing steadily, driven by demand in quantum computing and healthcare. On April 10, 2024, Bluefors expanded its Syracuse, New York facility,

becoming the largest U.S. manufacturer of dilution refrigerators. On January 7, 2025, Danaher Cryogenics acquired the Adiabatic Demagnetization Refrigerator product line from High Precision Devices, enhancing its cryogenic offerings. On March 17, 2025, Bluefors announced advancements in cryogenic measurement systems at the APS Global Physics Summit, improving cooling power for quantum computing. On May 27, 2025, Sumitomo Heavy Industries leveraged cryocooler technology to enhance liquid hydrogen storage, supporting clean energy initiatives. On June 10, 2025, Quantum Design signed an agreement to acquire Oxford Instruments' NanoScience Division, strengthening its cryogenic portfolio. These developments align with a projected CAGR of 5.5%–7.5% through 2030, reflecting the industry's focus on advanced cooling technologies.

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