

Cryogenic Superconductor Materials Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025 - 2034

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Abstracts

The Global Cryogenic Superconductor Materials Market was valued at USD 2.8 billion in 2024 and is estimated to grow at a CAGR of 9.3% to reach USD 7 billion by 2034. As critical industries increasingly adopt advanced technologies, demand for cryogenic superconductors is gaining traction across the globe. These materials, capable of conducting electricity with zero resistance at extremely low temperatures, are becoming essential components in sectors ranging from clean energy to high-precision medical imaging. Their unique electrical properties enable energy-efficient infrastructure and are increasingly being viewed as key to supporting next-generation power systems and scientific innovation. Energy efficiency goals worldwide continue to push the adoption of superconducting materials as part of larger sustainability efforts.

Superconductors can transmit electricity without energy loss, making them a vital solution for upgrading modern grids—especially as the share of renewable energy expands. Infrastructure development that integrates superconducting cables can help stabilize and enhance power transmission, offering superior performance over conventional methods. Meanwhile, the healthcare and scientific research industries remain strong end-users of these materials. Medical technologies such as MRI scanners depend on supercooled superconducting magnets to generate powerful, steady magnetic fields for precise internal imaging. Their usage is expanding in line with technological advancement and rising healthcare needs.

The low temperature superconductors (LTS) segment generated USD 1.1 billion in 2024 and is expected to reach USD 2.9 billion by 2034. These superconductors, primarily composed of compounds such as niobium-titanium (NbTi) and niobium-tin (Nb₃Sn), function optimally at temperatures under 20 Kelvin (around -253°C). Their dominance is

due to technological maturity, stability, and decades of development that have led to refined, cost-effective manufacturing processes. LTS materials remain a practical and preferred choice for many commercial systems because of their proven performance, especially in applications where stable, low-temperature environments can be reliably maintained.

The superconducting wires segment held a 45% share in 2024. These wires are valued for their ability to transmit electric current without resistance, translating to zero energy loss and unmatched operational efficiency. Their capability to handle higher current densities also allows for compact systems with greater magnetic field strengths—essential for advanced technologies in medicine, energy, and research. Their compact footprint and performance advantages continue to attract demand from industries seeking to improve power efficiency and system reliability.

United States Cryogenic Superconductor Materials Market was valued at USD 738.1 million in 2024 and is expected to grow at a CAGR of 9.1% through 2034. The United States remains at the forefront of this sector, driven by adoption of superconducting technologies in healthcare, power infrastructure, and high-tech industries. MRI systems are the primary application for these materials in the US, and as diagnostic imaging technology continues to evolve, so does the need for next-generation superconducting materials. These systems utilize highly stable magnetic fields, made possible by superconducting coils cooled to cryogenic temperatures. As healthcare services expand, along with upgrades and replacements of older systems, the demand for these specialized materials remains consistently strong.

Leading companies operating in the Global Cryogenic Superconductor Materials Market include Cryomagnetics, Hyper Tech Research, SAMRI Advanced Material, American Superconductor Corporation, Western Superconducting Technologies, Bruker Energy & Supercon Technologies, THEVA Dunnschichttechnik, Sam Dong, SuperPower, and Sumitomo Electric Industries Companies in the cryogenic superconductor materials space are investing heavily in advanced R&D to enhance material performance, reduce production costs, and increase scalability. Many are focusing on partnerships with universities and research institutions to accelerate the development of next-generation superconducting alloys. Another key strategy is expanding their manufacturing capabilities and integrating vertical operations for better supply chain control. Firms are also prioritizing customization, offering application-specific superconductors for MRI systems, power transmission, and quantum computing.

Comprehensive Market Analysis and Forecast

Industry trends, key growth drivers, challenges, future opportunities, and regulatory landscape

Competitive landscape with Porter's Five Forces and PESTEL analysis

Market size, segmentation, and regional forecasts

In-depth company profiles, business strategies, financial insights, and SWOT analysis

Contents

CHAPTER 1 METHODOLOGY & SCOPE

- 1.1 Market scope and definition
- 1.2 Research design
 - 1.2.1 Research approach
 - 1.2.2 Data collection methods
- 1.3 Data mining sources
 - 1.3.1 Global
 - 1.3.2 Regional/Country
- 1.4 Base estimates and calculations
 - 1.4.1 Base year calculation
 - 1.4.2 Key trends for market estimation
- 1.5 Primary research and validation
 - 1.5.1 Primary sources
- 1.6 Forecast model
- 1.7 Research assumptions and limitations

CHAPTER 2 EXECUTIVE SUMMARY

- 2.1 Industry 360° synopsis
- 2.2 Key market trends
 - 2.2.1 Regional
 - 2.2.2 Material type
 - 2.2.3 End use
- 2.3 TAM analysis, 2025-2034
- 2.4 CXO perspectives: Strategic imperatives
 - 2.4.1 Executive decision points
 - 2.4.2 Critical success factors
- 2.5 Outlook and strategic recommendations

CHAPTER 3 INDUSTRY INSIGHTS

- 3.1 Industry ecosystem analysis
 - 3.1.1 Supplier landscape
 - 3.1.2 Profit margin
 - 3.1.3 Value addition at each stage
 - 3.1.4 Factor affecting the value chain

- 3.1.5 Disruptions
- 3.2 Industry impact forces
 - 3.2.1 Growth drivers
 - 3.2.2 Industry pitfalls and challenges
 - 3.2.3 Market opportunities
- 3.3 Growth potential analysis
- 3.4 Regulatory landscape
 - 3.4.1 North America
 - 3.4.2 Europe
 - 3.4.3 Asia Pacific
 - 3.4.4 Latin America
 - 3.4.5 Middle East & Africa
- 3.5 Porter's analysis
- 3.6 PESTEL analysis
 - 3.6.1 Technology and innovation landscape
 - 3.6.2 Current technological trends
 - 3.6.3 Emerging technologies
- 3.7 Price trends
 - 3.7.1 By region
- 3.8 Future market trends
- 3.9 Technology and innovation landscape
 - 3.9.1 Current technological trends
 - 3.9.2 Emerging technologies
- 3.10 Patent landscape
- 3.11 Trade statistics (HS code) (Note: the trade statistics will be provided for key countries only)
 - 3.11.1 Major importing countries
 - 3.11.2 Major exporting countries
- 3.12 Sustainability and environmental aspects
 - 3.12.1 Sustainable practices
 - 3.12.2 Waste reduction strategies
 - 3.12.3 Energy efficiency in production
 - 3.12.4 Eco-friendly initiatives
- 3.13 Carbon footprint considerations

CHAPTER 4 COMPETITIVE LANDSCAPE, 2024

- 4.1 Introduction
- 4.2 Company market share analysis

- 4.2.1 By region
 - 4.2.1.1 North America
 - 4.2.1.2 Europe
 - 4.2.1.3 Asia Pacific
 - 4.2.1.4 LATAM
 - 4.2.1.5 MEA
- 4.3 Company matrix analysis
- 4.4 Competitive analysis of major market players
- 4.5 Competitive positioning matrix
- 4.6 Key developments
 - 4.6.1 Mergers & acquisitions
 - 4.6.2 Partnerships & collaborations
 - 4.6.3 New product launches
 - 4.6.4 Expansion plans

CHAPTER 5 MARKET SIZE AND FORECAST, BY MATERIAL TYPE, 2021-2034 (USD MILLION) (TONS)

- 5.1 Key trends
- 5.2 Low temperature superconductors (LTS)
 - 5.2.1 Niobium-Titanium (NbTi) alloys
 - 5.2.2 Niobium-Tin (Nb₃Sn) compounds
 - 5.2.3 Magnesium diboride (MgB₂)
- 5.3 High temperature superconductors (HTS)
 - 5.3.1 YBCO (YBa₂Cu₃O₇) materials
 - 5.3.2 BSCCO (Bi₂Sr₂Ca₂Cu₃O₁₀) materials
 - 5.3.3 Iron-based superconductors
 - 5.3.4 Other HTS materials (TBCCO, Hg-based)
- 5.4 Emerging superconductor materials
 - 5.4.1 Topological superconductors
 - 5.4.2 Organic superconductors
 - 5.4.3 Room temperature superconductor
 - 5.4.4 Hybrid and composite materials

CHAPTER 6 MARKET SIZE AND FORECAST, BY PRODUCT FORM, 2021-2034 (USD MILLION) (TONS)

- 6.1 Key trends
- 6.2 Superconducting wires

- 6.2.1 Round wire products
 - 6.2.1.1 Multifilamentary wire construction
 - 6.2.1.2 AC loss characteristics and applications
- 6.2.2 Flat wire and tape products
 - 6.2.2.1 Coated conductor technology
 - 6.2.2.2 High current density applications
- 6.2.3 Stranded and cabled conductors
 - 6.2.3.1 High current applications
 - 6.2.3.2 Fusion magnet and power cable use
- 6.3 Bulk superconductor materials
 - 6.3.1 Single crystal bulk materials
 - 6.3.1.1 Trapped field magnet applications
 - 6.3.1.2 Magnetic levitation systems
 - 6.3.2 Polycrystalline bulk materials
 - 6.3.2.1 Cost-effective bulk applications
 - 6.3.2.2 Magnetic shielding and bearings
 - 6.3.3 Textured and oriented materials
 - 6.3.3.1 Enhanced performance characteristics
 - 6.3.3.2 Specialized high-field applications
- 6.4 Thin film superconductors
 - 6.4.1 Epitaxial thin films
 - 6.4.1.1 Electronic and sensor applications
 - 6.4.1.2 Quantum device integration
 - 6.4.2 Multilayer and heterostructure films
 - 6.4.2.1 Advanced quantum computing applications
 - 6.4.2.2 Josephson junction technology
- 6.5 Superconducting powders and precursors
 - 6.5.1 Raw material powders
 - 6.5.2 Precursor chemicals and compounds
 - 6.5.3 Specialty processing materials

CHAPTER 7 MARKET SIZE AND FORECAST, BY END USE, 2021-2034 (USD MILLION) (TONS)

- 7.1 Key trends
- 7.2 Medical and healthcare applications
 - 7.2.1 Magnetic resonance imaging (MRI) systems
 - 7.2.2 Nuclear magnetic resonance (NMR) spectroscopy
 - 7.2.2.1 Ultra-high field NMR systems (>1 Ghz)

- 7.2.2.2 Research and pharmaceutical applications
- 7.2.3 Particle therapy and medical accelerators
 - 7.2.3.1 Proton and ion therapy systems
 - 7.2.3.2 Compact accelerator development
- 7.3 Energy and power applications
 - 7.3.1 Power transmission and distribution
 - 7.3.1.1 Superconducting power cables
 - 7.3.1.2 Fault current limiters
 - 7.3.1.3 Power transformers and substations
 - 7.3.2 Energy storage systems
 - 7.3.2.1 Superconducting magnetic energy storage (SME)
 - 7.3.2.2 Grid stabilization and power quality
 - 7.3.2.3 Renewable energy integration
 - 7.3.3 Electric generators and motors
 - 7.3.3.1 Wind turbine generators
 - 7.3.3.2 Ship propulsion motors
 - 7.3.3.3 Industrial motor applications
- 7.4 Fusion energy and research
 - 7.4.1 Magnetic confinement fusion reactors
 - 7.4.1.1 Iter project and international collaboration
 - 7.4.1.2 Private fusion company initiatives
 - 7.4.1.3 Toroidal and poloidal field coils
 - 7.4.2 High energy physics research
 - 7.4.2.1 Particle accelerators and colliders
 - 7.4.2.2 Large hadron collider (LHC) applications
 - 7.4.2.3 Future accelerator projects
- 7.5 Quantum computing and electronics
 - 7.5.1 Quantum computing systems
 - 7.5.1.1 Superconducting qubit technology
 - 7.5.1.2 Quantum processor development
 - 7.5.1.3 Cryogenic quantum computing infrastructure
 - 7.5.2 Superconducting electronics
 - 7.5.2.1 Single photon detectors (SSPDS)
 - 7.5.2.2 Squid sensors and magnetometers
 - 7.5.2.3 Josephson junction devices
 - 7.5.3 Quantum sensors and metrology
 - 7.5.3.1 Ultra-sensitive magnetic field detection
 - 7.5.3.2 Gravitational wave detection
- 7.6 Transportation applications

- 7.6.1 Magnetic levitation (Maglev) systems
 - 7.6.1.1 High-speed rail transportation
 - 7.6.1.2 Urban transit applications
- 7.6.2 Electric aviation
 - 7.6.2.1 Aircraft propulsion motors
 - 7.6.2.2 Lightweight power systems
- 7.7 Industrial and scientific applications
 - 7.7.1 Materials processing and manufacturing
 - 7.7.2 Magnetic separation systems
 - 7.7.3 Scientific research instruments

CHAPTER 8 MARKET SIZE AND FORECAST, BY REGION, 2021-2034 (USD MILLION) (TONS)

- 8.1 Key trends
- 8.2 North America
 - 8.2.1 U.S.
 - 8.2.2 Canada
- 8.3 Europe
 - 8.3.1 UK
 - 8.3.2 Germany
 - 8.3.3 France
 - 8.3.4 Italy
 - 8.3.5 Spain
- 8.4 Asia Pacific
 - 8.4.1 China
 - 8.4.2 India
 - 8.4.3 Japan
 - 8.4.4 South Korea
 - 8.4.5 Australia
- 8.5 Latin America
 - 8.5.1 Brazil
 - 8.5.2 Mexico
 - 8.5.3 Argentina
- 8.6 MEA
 - 8.6.1 South Africa
 - 8.6.2 Saudi Arabia
 - 8.6.3 UAE

CHAPTER 9 COMPANY PROFILES

- 9.1 American Superconductor Corporation
- 9.2 SuperPower
- 9.3 Sumitomo Electric Industries
- 9.4 Bruker Energy & Supercon Technologies
- 9.5 Hyper Tech Research
- 9.6 THEVA Dunnschichttechnik
- 9.7 Western Superconducting Technologies
- 9.8 SAMRI Advanced Material
- 9.9 Sam Dong
- 9.10 Cryomagnetics

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