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Global Iron-59 Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Iron-59 market size is expected to reach $ million by 2032, rising at a market growth of %CAGR during the forecast period (2026-2032).

In 2025, global iron-59 production was approximately 180 grams, with an average global market price of approximately US$0.85 million per gram. Total global iron-59 production capacity reached approximately 260 grams in 2025. The industry average gross margin for this product was approximately 58%. Iron-59 (^59Fe) is an artificially produced radioactive isotope of iron with an atomic number of 26 and a mass number of 59. Unlike naturally occurring stable iron isotopes (^54Fe, ^56Fe, ^57Fe, and ^58Fe), Iron-59 is mainly produced through nuclear reactions, such as neutron activation of Iron-58 (^58Fe) targets via the ^58Fe(n,?)^59Fe reaction. With a half-life of approximately 44.5 days, Iron-59 undergoes beta-minus decay and emits characteristic radiation, making it valuable in life science research, medical studies, hematology, iron metabolism tracing, and nuclear chemistry applications. Since iron plays essential roles in hemoglobin synthesis, oxygen transport, and cellular metabolism, Iron-59 has long been used as an important radioactive tracer for studying iron absorption, transport, storage, and metabolic pathways.

The upstream segment of the Iron-59 industry mainly includes stable iron isotope materials, high-purity iron resources, nuclear reaction targets, and irradiation facility systems. Production of Iron-59 typically requires high-purity Iron-58 target materials, which are irradiated in research reactors or other neutron sources, followed by chemical separation, purification, and radioactive quality testing. Key upstream factors include stable isotope enrichment technology, target preparation processes, and nuclear facility capabilities. The availability of enriched Iron-58 directly affects production efficiency and supply stability. Due to strict nuclear regulations, irradiation requirements, and

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specialized technical expertise, only a limited number of global facilities have stable Iron-59 production capabilities. The midstream segment mainly covers radionuclide production, radiochemical separation, purification, activity measurement, quality control, and specialized packaging and transportation services. Suppliers typically provide Iron-59 in different activity levels and chemical forms according to research requirements, such as Iron-59 chloride (^59FeCl?) solutions, iron salt forms, or customized tracer products. Although Iron-59 has a relatively longer half-life compared with many medical radionuclides, radioactive decay still requires careful production scheduling, quality assurance systems, and specialized radioactive logistics. The major value-added capabilities in the midstream sector include production efficiency, radiochemical purity control, and technical support for scientific applications. The downstream applications of Iron-59 mainly focus on life science research, medical studies, hematology, nutrition research, and fundamental nuclear science. The most important application of Iron-59 is as an iron metabolism tracer, allowing researchers to study iron absorption, transportation, storage, and hemoglobin formation processes in biological systems. It is also used in anemia research, bone marrow function studies, and investigations of iron-related diseases. In addition, Iron-59 has applications in plant nutrition research, materials science, and nuclear chemistry experiments. In the future, with the development of precision life sciences, metabolic disease research, and isotope tracing technologies, demand for high-quality Iron-59 products is expected to remain stable, maintaining a small-volume, high-value, research-driven market structure.

The primary growth drivers of the Iron-59 industry come from the increasing demand for isotope tracing technologies in life sciences, medical research, and precision biology studies. Iron is an essential trace element involved in critical biological processes such as hemoglobin synthesis, oxygen transport, and cellular metabolism. Therefore, high-sensitivity tracing technologies have long been used in iron metabolism research. As a classic radioactive tracer, Iron-59 enables researchers to investigate iron absorption, transportation, storage, and utilization mechanisms, and is widely applied in anemia studies, nutritional metabolism research, bone marrow function studies, and animal model experiments. With deeper research into metabolic disorders, blood-related diseases, and nutrition-related conditions, demand for high-quality Iron-59 products from research institutions and biotechnology companies continues to grow steadily.

Advances in radionuclide production technologies and improvements in scientific infrastructure represent important factors supporting the development of the Iron-59 industry. Iron-59 is mainly produced through neutron activation of Iron-58 (^58Fe) targets, and its supply capability depends on enriched Iron-58 availability, research

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reactor operation, radiochemical separation technologies, and quality control systems. In recent years, upgrades of research nuclear facilities and expansion of isotope production platforms have improved production efficiency and supply reliability. Meanwhile, developments in automated radiochemistry systems, precision activity measurement instruments, and standardized quality assurance processes have further enhanced the consistency and reliability of research-grade Iron-59 products.

In the future, the Iron-59 industry will continue to develop as a small-volume, high-value, research-driven isotope market. Since Iron-59 mainly serves fundamental life science research, it is unlikely to generate large-scale industrial demand. Instead, the market will remain focused on specialized supply for universities, research institutes, medical research centers, and biotechnology companies. Future growth opportunities will mainly come from precision medicine, metabolomics, nutrition science, isotope tracing technology innovation, and deeper studies of biological mechanisms. As research projects require higher analytical accuracy and tracer sensitivity, high-purity and high-specific-activity Iron-59 products will become increasingly important.

This report studies the global Iron-59 production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Iron-59 and provides market size (US$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of Iron-59 that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global Iron-59 total production and demand, 2021-2032, (Gram)
Global Iron-59 total production value, 2021-2032, (USD Million)
Global Iron-59 production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (Gram), (based on production site)
Global Iron-59 consumption by region & country, CAGR, 2021-2032 & (Gram)
U.S. VS China: Iron-59 domestic production, consumption, key domestic manufacturers and share
Global Iron-59 production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (Gram)
Global Iron-59 production by Type, production, value, CAGR, 2021-2032, (USD Million) & (Gram)

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Global Iron-59 production by Application, production, value, CAGR, 2021-2032, (USD Million) & (Gram)

This report profiles key players in the global Iron-59 market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Rosatom, NIDC(DOE IP), POLATOM, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World Iron-59 market

Detailed Segmentation:

Each section contains quantitative market data including market by value (US$ Millions), volume (production, consumption) & (Gram) and average price (US$/g) by manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.

Global Iron-59 Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

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Global Iron-59 Market, Segmentation by Type:

Metal Oxide

Solution

Global Iron-59 Market, Segmentation by Radioactivity:

Low Activity Iron-59

Medium Activity Iron-59

High Activity Iron-59

Global Iron-59 Market, Segmentation by Production Method:

Iron-58 Neutron-activated Production

Particle Irradiation Produced Iron-59

Isotope Separation Assisted Iron-59

Global Iron-59 Market, Segmentation by Radiochemical Purity:

General Research Grade

High Purity Grade

Ultra-high Purity Grade

Global Iron-59 Market, Segmentation by Application:

Biological Research

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Medical Research

Companies Profiled:

Rosatom

NIDC(DOE IP)

POLATOM

Key Questions Answered:
1. How big is the global Iron-59 market?
2. What is the demand of the global Iron-59 market?
3. What is the year over year growth of the global Iron-59 market?
4. What is the production and production value of the global Iron-59 market?
5. Who are the key producers in the global Iron-59 market?
6. What are the growth factors driving the market demand?

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