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Radioisotope Identification Devices Market by Technology (Personal, Handheld, Fixed, Spectroscopic), Application (Homeland Security, Nuclear Power Plant, Medical, Environmental, CBRN), End User (Government, Hospital, Academia, Industrial) - Global Forecast to 2031

https://marketpublishers.com/r/R758BCF7AAE3EN.html
Date: May 2026
Pages: 259
Price: US$ 4,950.00 (Single User License)
ID: R758BCF7AAE3EN

Abstracts

The global radioisotope identification devices market is projected to reach USD 2.85 billion by 2031 from USD 1.93 billion in 2025, at a CAGR of 6.9% from 2026 to 2031. The radioisotope identification devices market is growing due to a global increase in nuclear security and the trafficking of radioactive materials. Governments in particular are investing significantly in advanced technologies that help with radiation detection to make border control, cargo screening, and countering terrorism more effective. As RIIDs are used to quickly and accurately identify radioactive materials, they are crucial for providing security for homes, law enforcement agencies, and for emergency response to incidents involving radiological materials.

By product type, the spectroscopic personal radiation detectors segment is expected to register the highest CAGR during the forecast period.

By product type, the radioisotope identification devices market is segmented into personal radiation detectors, handheld personal radiation detectors, radioisotope identification devices, fixed radiation monitoring systems, spectroscopic personal radiation detectors, and other products. Spectroscopic personal radiation detectors (SPRDs) are expected to register the highest CAGR in the market due to their advanced capability to not only detect radiation but also accurately identify specific isotopes, which is increasingly critical for security, defense, and emergency response

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applications. Unlike conventional personal radiation detectors, SPRDs provide high-resolution spectral analysis, enabling users to distinguish between benign and threatening radioactive sources, thereby significantly reducing false alarms. Growing concerns around nuclear terrorism, illicit trafficking, and CBRN threats are driving demand for more precise and reliable identification tools. Additionally, advancements in detector materials (such as CdZnTe and LaBr?), miniaturization, and AI-enabled analytics are making SPRDs more portable, user-friendly, and efficient for field deployment. Increasing regulatory requirements and modernization programs across homeland security and defense agencies further support the rapid adoption of these high-performance devices, resulting in their strong projected growth.

By application, the homeland security & border protection segment is projected to register the highest CAGR during the forecast period.

The homeland security & border protection segment is expected to witness the highest CAGR in the radioisotope identification devices (RIID) market due to escalating concerns over nuclear smuggling, radiological terrorism, and illicit trafficking of radioactive materials, which are driving governments to strengthen surveillance and detection capabilities at borders, ports, and airports. Increasing geopolitical tensions and the need for multi-layered security infrastructure are prompting significant investments in advanced radiation detection technologies, including RIIDs, portal monitors, and integrated screening systems. Additionally, international mandates and guidelines from organizations such as the International Atomic Energy Agency (IAEA) are pushing countries to enhance radiation monitoring and compliance frameworks. Continuous modernization of border security systems, coupled with the adoption of AI-enabled and networked detection solutions, is further accelerating demand, making homeland security and border protection the fastest-growing application segment in the market.

By end user, the government & defense agencies segment accounted for the highest market share in 2025.

The government & defense agencies segment accounted for the largest share in the radioisotope identification devices (RIIDs) market in 2025. High and sustained budgets for both defense and homeland security are driving the widespread use of RIIDs. Long-term procurement of RIIDs by government and defense agency customers has created a robust base of RIIDs throughout airports, seaports, and borders. Moreover, increasing global concerns about the illegal transport of nuclear material through smuggling and the increasing threat of radiological weapons of mass destruction have led to strict

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enforcement mandates (both domestically and internationally). This will continue to fuel strong and consistent demand from this segment.

Asia Pacific is expected to register the highest growth rate in the market during the forecast period.

Asia Pacific is expected to witness the highest growth rate in the radioisotope identification devices (RIIDs) market due to rapid industrialization, expanding nuclear energy programs, and increasing investments in homeland security and radiation safety infrastructure. Countries such as China, India, and Japan are actively strengthening their nuclear capabilities and regulatory frameworks, driving the need for advanced radiation detection and isotope identification systems. Additionally, the growing adoption of nuclear medicine and radiopharmaceuticals in the healthcare sector is further supporting market expansion. Rising awareness of radiological threats, coupled with government initiatives to enhance border security and environmental monitoring, is accelerating the deployment of RIIDs across the region, making Asia Pacific the fastest-growing market globally.

A breakdown of the primary participants referred to for this report is provided below:

By Company Type: Tier 1 (40%), Tier 2 (30%), and Tier 3 (30%)

By Designation: C-level Executives (55%), Directors (27%), and Others (18%)

By Region: North America (35%), Europe (32%), Asia Pacific (25%), Latin America (6%), and the Middle East & Africa (2%)

The prominent players in this market are AMETEK (US), ARKTIS Radiation Detectors (Switzerland), ATOMTEX (Belarus), Bertin Instruments (France), BNC (USA), Fortive (US), H3D (US), Hitachi (Japan), Kromek Group (UK), Landauer (US), Ludlum Measurements (USA), Mirion Technologies (US), Nucsafe (South Korea), Polimaster (Belarus), Radiation Detection Company (US), Rapiscan (US), RSI (US), Smiths Detection (UK), Symetrica (UK), Teledyne FLIR Defense (US), and Thermo Fisher Scientific (US), among others.

Research Coverage

The radioisotope identification devices market is segmented by product type,

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application, end user, and region. The report reviews the leading companies competing in the radioisotope identification devices market. A micro-level analysis can be conducted to examine trends, growth opportunities, and contributions to the market. Additionally, it highlights potential revenue growth opportunities across various market segments in five major regions.

Key Benefits of Buying the Report

The report is valuable for new entrants in the radioisotope identification devices market as it provides comprehensive information about the market. This information is essential for understanding various investment opportunities. The report provides insights into both key and smaller players in the market, which can help create a solid basis for risk analysis when making investment decisions. It accurately segments the market by end users and regions, providing focused insights into specific market segments. Additionally, the report highlights key trends, challenges, growth drivers, and opportunities to support strategic decision-making through a thorough analysis.

The report provides insights into the following points:

Key drivers (Rising nuclear security threats and illicit trafficking of radioactive materials, Increasing government spending on homeland security and defense), restraints (High cost of advanced RIIDs and spectroscopic technologies, Stringent regulatory approvals and compliance requirements), opportunities (Expansion of nuclear energy programs in emerging economies, Growing adoption of nuclear medicine and radiopharmaceuticals), and challenges (Technical limitations in detecting mixed or low-intensity isotopes, Shortage of skilled professionals to operate advanced RIIDs)

Product Development/Innovation: Emerging technologies in space, R&D, recent product launches & approvals in the radioisotope identification devices market

Market Growth: In-depth insights into the radioisotope identification devices market across varied geographies

Market Diversification: Detailed analysis of new products, unexplored geographies, latest trends, and investments in the radioisotope identification devices market

Competitive Assessment: Detailed assessment of market share, service

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offerings, leading strategies of major players such as Mirion Technologies (US), Nucsafe (South Korea), Polimaster (Belarus), Radiation Detection Company (US), Rapiscan (US), RSI (US), Smiths Detection (UK), Symetrica (UK), Teledyne FLIR Defense (US), and Thermo Fisher Scientific (US).

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List Of Tables

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List Of Figures

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