

North America Radiation Cured Coatings Market By Raw Material (Oligomers, Monomers, Photo initiators, Additives), By Application (Adhesives, Pulp and Paper, Printing Inks, Wood, Glass, Others), By Country, Competition, Forecast and Opportunities, 2019-2029F

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Report description:

□□North America Radiation Cured Coatings Market was valued at USD 3.57 billion in 2023 and is anticipated to reach USD 4.72 Billion with a CAGR of 4.86% through the forecast period.

The North America Radiation Cured Coatings Market has emerged as a beacon of innovation within the coatings industry, offering a diverse array of advantages to meet the varied needs of industrial applications. Utilizing the power of ultraviolet (UV) or electron beam (EB) curing techniques, these coatings have experienced significant growth, propelled by their environmentally sustainable nature, rapid curing capabilities, and high-performance attributes. Positioned at the forefront of coating technologies, the radiation-cured coatings market in North America is driven by a convergence of factors including sustainability, superior performance, and continuous technological advancements.

Industries across North America are increasingly prioritizing efficiency, environmental responsibility, and the attainment of high-quality finishes, thus driving the demand for radiation-cured coatings. These coatings offer notable benefits such as reduced environmental impact, enhanced productivity due to faster curing times, and superior performance characteristics including resistance to chemicals, abrasion, and weathering.

Apart from their performance advantages, radiation-cured coatings align with the growing trend towards sustainability in the coatings industry. Their low VOC (volatile organic compound) emissions contribute to improved air quality and reduced environmental footprint, making them a preferred choice for environmentally conscious manufacturers. Furthermore, technological innovations continue to drive advancements in radiation-cured coatings, expanding their applicability across various sectors including automotive, aerospace, electronics, and packaging. The development of new formulations and curing techniques enhances the versatility and performance of these coatings, opening new opportunities for market growth. Additionally,

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Government incentives and mandates are driving the increased adoption of electric vehicles, with initiatives such as the Zero Emission Vehicles (ZEV) Program focused on boosting the number of clean and zero-emission vehicles on the road.

The North America Radiation Cured Coatings Market is characterized by a competitive landscape with key players investing in research and development to stay at the forefront of innovation. Collaborations and partnerships between manufacturers, raw material suppliers, and end-users further drive market growth by facilitating the development of tailored solutions to meet specific industry needs.

Key Market Drivers

Growing Environmental Sustainability

The North America Radiation Cured Coatings Market is driven by several key factors that highlight its significance in the coatings industry, with sustainability emerging as a prominent driver. One of the primary drivers for the adoption of radiation-cured coatings is their inherently low volatile organic compound (VOC) content. VOCs are known contributors to air pollution and pose health risks, making the reduced emission of VOCs a compelling feature of radiation-cured coatings. This aligns with stringent environmental regulations and industry standards, positioning these coatings as a sustainable choice for manufacturers.

Radiation-cured coatings eliminate the need for hazardous solvents in their formulation, enhancing workplace safety and minimizing the release of harmful substances into the environment during application and curing processes. This aspect not only addresses environmental concerns but also contributes to the overall health and safety of workers in the coatings industry.

Sustainability has become the new focal point, and UV, UV LED, and EB curing offer a range of significant benefits. The energy curing community gathered in Orlando, FL, for RadTech 2024, the biennial convention hosted by RadTech International North America, The Association for Ultraviolet and Electron Beam Technologies. The event, aptly themed "Today's Choices, Tomorrow's Future: UV+EB for Sustainable & Responsible Manufacturing," highlighted the industry's focus on sustainability. RadTech 2024 featured three short courses, 30 conference sessions with over 90 presentations, more than 65 exhibitors, and a series of panel discussions covering key topics such as coil coatings, metal packaging, the regulatory landscape, and more.

The energy-efficient nature of radiation curing processes is another significant driver of market growth. UV curing consumes less energy compared to traditional curing methods, leading to lower carbon footprints, and supporting North America's efforts to mitigate climate change. This emphasis on energy efficiency resonates with industries seeking environmentally friendly solutions while maintaining high-quality standards.

The rapid curing times associated with radiation-cured coatings result in less waste during the production process. The efficiency in curing translates to lower material consumption and reduced energy requirements, further reducing the overall environmental impact throughout the product lifecycle. This aspect appeals to manufacturers looking to streamline their operations while minimizing their ecological footprint. The growing emphasis on sustainable building practices in North America presents a significant opportunity for radiation-cured coatings. These coatings contribute to achieving green building certifications by meeting criteria related to low VOC emissions and sustainable material choices. As the construction industry continues to prioritize environmental stewardship, the demand for radiation-cured coatings is expected to rise, further driving market growth.

Rapid Curing Time boosting Market

The North America Radiation Cured Coatings Market is driven by several key factors that highlight the efficiency and productivity advantages of these coatings. A hallmark of radiation-cured coatings is their rapid curing upon exposure to ultraviolet (UV) or electron beam (EB) radiation. This swift curing directly translates to increased productivity in manufacturing processes, as it enables industries to achieve higher throughput and meet demanding production schedules.

The efficiency of radiation curing processes contributes to minimizing downtime in manufacturing operations. With coatings curing almost instantaneously, the need for extended curing periods or complex post-curing steps is diminished, enhancing overall operational efficiency and allowing for faster turnaround times. The rapid curing time of radiation-cured coatings also corresponds to energy efficiency, a significant driver in the market. Traditional curing methods often involve prolonged heating processes, consuming substantial energy. In contrast, UV or EB curing requires shorter exposure times, leading to lower energy consumption and operational costs for manufacturers.

Industries with high-volume production requirements, such as packaging and automotive manufacturing, benefit significantly from the rapid curing times of radiation-cured coatings. According to the International Trade Administration, U.S. light vehicle sales reached 14.5 million units in 2020. The United States remains the world's second-largest market for both vehicle sales and

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production. The ability to achieve quick and uniform curing on a large scale enhances throughput, meeting the demands of mass production effectively. The rapid curing nature of these coatings aligns seamlessly with just-in-time manufacturing principles, driving market growth. Industries can respond swiftly to changing market demands, producing coatings on-demand with minimal lead times. This flexibility positions radiation-cured coatings as a strategic choice for industries requiring agile and responsive manufacturing processes in the dynamic North American market.

North America Market Expansion

North America market expansion is fueled by the diverse applications of radiation-cured coatings across various end-use industries. From automotive and electronics to packaging and healthcare, the versatility of these coatings caters to a spectrum of sectors, driving their adoption on a North America scale. The radiation-cured coatings market is witnessing substantial growth in emerging economies. As countries ramp up industrialization and infrastructure development, the demand for advanced coatings with rapid curing times and high-performance characteristics is propelling the market forward.

Industry players are increasingly entering strategic alliances and collaborations to expand their North America footprint. These partnerships facilitate the exchange of technologies, market insights, and resources, enabling companies to establish a stronger presence in new and emerging markets.

Established markets in North America and Europe are witnessing a steady adoption of radiation-cured coatings, driven by the need for sustainable and efficient coating solutions. The technology's ability to align with stringent environmental regulations positions it as a viable choice in mature markets. The North America expansion of the radiation-cured coatings market is further fueled by the ability of manufacturers to customize formulations to meet regional and industry-specific requirements. This adaptability enhances the coatings' suitability for diverse markets, contributing to their widespread acceptance.

Key Market Challenges

High initial Capital Investment

The expansion of the North America Radiation Cured Coatings Market is fueled by several key drivers, highlighting the versatility and adaptability of these coatings across various end-use industries. One significant driver is the diverse applications of radiation-cured coatings across sectors such as automotive, electronics, packaging, and healthcare. Their ability to cater to a spectrum of industries drives their adoption on a North America scale, driving market growth.

Substantial growth is observed in emerging economies within North America. As countries in the region ramp up industrialization and infrastructure development, there is an increasing demand for advanced coatings with rapid curing times and high-performance characteristics. This demand propels the market forward, creating opportunities for expansion. Strategic alliances and collaborations among industry players are another driver of market expansion in North America. These partnerships facilitate the exchange of technologies, market insights, and resources, enabling companies to establish a stronger presence in new and emerging markets within the region.

Moreover, established markets in North America and Europe are witnessing steady adoption of radiation-cured coatings, driven by the need for sustainable and efficient coating solutions. The technology's ability to align with stringent environmental regulations positions it as a viable choice in mature markets, contributing to its continued growth. The ability of manufacturers to customize formulations to meet regional and industry-specific requirements drives the expansion of the North America Radiation Cured Coatings Market. This adaptability enhances the coatings' suitability for diverse markets, contributing to their widespread acceptance and further fueling market growth in the region.

Key Market Trends

Expansion in End Use Industries

The North America Radiation Cured Coatings Market is witnessing a significant trend characterized by the diversification of applications across various industries. Traditionally, radiation-cured coatings were confined to specific sectors, but they are now finding widespread acceptance in unconventional areas, driving market growth. One prominent trend is the increasing adoption of radiation-cured coatings in the electronics and technology sector. These coatings offer rapid curing times and high-performance characteristics, making them ideal for protecting electronic components and devices while also enhancing their aesthetics. Another emerging trend is the utilization of radiation-cured coatings in the medical devices and healthcare industry. These coatings provide advantages such as biocompatibility and sterilization resistance, catering to the sector's demand for innovative solutions in coating medical equipment.

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The proliferation of 3D printing technologies has also spurred demand for radiation-cured coatings. These coatings play a vital role in enhancing the performance of UV-curable resins used in 3D printing applications, addressing the unique challenges posed by additive manufacturing processes. The aerospace and aviation industry is increasingly adopting radiation-cured coatings due to their lightweight nature and high-performance properties. These coatings meet the industry's stringent standards for durability while also offering the desired level of performance, driving their adoption in aircraft components and structures.

Innovation in Formulation Technologies

The North America Radiation Cured Coatings Market is witnessing several notable trends that are shaping the landscape of coating technologies. Advancements in photo initiator technologies are driving innovation, with the development of novel catalysts enhancing the efficiency and speed of curing processes. This results in rapid curing times, a defining characteristic of radiation-cured coatings. Formulation technologies are also evolving to offer greater control over coating properties. Tailored oligomers and monomers allow for precise adjustments to characteristics such as flexibility, hardness, and adhesion, catering to specific performance requirements across diverse applications.

The integration of precise additives is another significant trend in formulation innovation. These additives enhance functionalities such as scratch resistance, UV resistance, and antimicrobial properties, expanding the utility of radiation-cured coatings across industries where stringent performance standards are crucial.

Hybrid formulations are emerging as a novel approach, combining the strengths of radiation curing with other curing mechanisms. These dual-cure systems provide versatility, enabling coatings to cure through multiple mechanisms and offering enhanced performance tailored to specific application needs. There is a growing focus on environmental sustainability in formulation technologies. Innovations in low volatile organic compound (VOC) formulations address regulatory demands and industry preferences for eco-friendly coatings, aligning with the market's commitment to environmental responsibility.

Growing Emphasis on Sustainability

In the North America Radiation Cured Coatings Market, sustainability is emerging as a predominant trend, with a focus on reducing volatile organic compounds (VOCs). The industry is prioritizing formulations with lower VOC content to align with regional efforts to mitigate air pollution and promote healthier working environments. Formulation technologies are undergoing a significant shift towards eco-friendly ingredients, driving innovations that deliver high performance while minimizing environmental impact. This trend reflects the market's increasing demand for sustainable solutions across various industries.

A notable development is the exploration of waterborne alternatives in radiation-cured coatings. Waterborne formulations offer a lower environmental footprint and reduced solvent usage, appealing to industries seeking coatings that comply with stringent environmental regulations.

Sustainability efforts in radiation-cured coatings extend throughout the product lifecycle, adopting a cradle-to-grave approach. Companies are considering factors such as raw material sourcing, production processes, application methods, and end-of-life considerations to minimize environmental impact. The construction industry, in particular, is a key driver of demand for sustainable radiation-cured coatings. These coatings, meeting green building standards, contribute to eco-friendly structures, aligning with the sector's growing emphasis on sustainable building practices.

Segmental Insights

Raw Material Insights

Based on raw materials, Oligomers is dominating the North America radiation-cured coatings market. Oligomers serve as the backbone of radiation-cured coatings, defining their fundamental properties. These are polymeric compounds with a predetermined molecular weight that determines key characteristics such as flexibility, adhesion, and curing speed. Innovations in oligomer design allow formulators to tailor coatings for specific applications, ensuring a precise balance of properties. Monomers are the reactive components that, when polymerized, contribute to the final structure of the coating. The selection of monomers influences properties such as hardness, chemical resistance, and curing speed. The ability to fine-tune these characteristics is central to the versatility of radiation-cured coatings, allowing for customization to meet diverse industry requirements.

Country Insights

Based on the country, the North America radiation-cured coatings market is witnessing significant growth, propelled by the collaborative efforts of the United States, Mexico, and Canada. Radiation-cured coatings, renowned for their quick curing times and environmental benefits, find applications across various industries, including automotive, electronics, and packaging. This

article explores the distinct contributions of these North American nations in driving the regional radiation-cured coatings market. At the forefront of the North America radiation-cured coatings market is the United States, a hub of technological advancements and innovation. The country's thriving manufacturing sector, particularly in automotive and electronics, has fueled the demand for high-performance coatings. The U.S. is a pioneer in developing and adopting radiation-cured coatings, leveraging cutting-edge research and development to enhance the efficiency and sustainability of coating processes.

Mexico's strategic location and robust manufacturing capabilities have positioned it as a key player in the regional radiation-cured coatings market. The country's automotive and aerospace industries, in particular, have embraced these coatings for their ability to deliver superior performance and meet stringent quality standards. As Mexico continues to attract foreign investments and foster a conducive business environment, the demand for radiation-cured coatings is on the rise, contributing significantly to the regional market. Canada's commitment to sustainability has influenced the adoption of radiation-cured coatings with eco-friendly formulations. The emphasis on reducing environmental impact aligns with global trends, and Canadian industries are increasingly choosing radiation-cured coatings as a greener alternative. This eco-conscious approach not only reflects Canada's dedication to responsible manufacturing but also contributes to the overall growth of the North America radiation-cured coatings market.

Key Market Players

- Dow Chemical Company
- PPG Industries, Inc.
- The Sherwin-Williams Company
- Akzo Nobel N.V.
- ICA SpA
- Axalta Coating Systems Ltd.
- Covestro AG
- The Lubrizol Corporation
- NEI Corporation

Report Scope:

In this report, the North America Radiation Cured Coatings Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

□□North America Radiation Cured Coatings Market, By Raw Material:

- o Oligomers
- o Monomers
- o Photo Initiators
- o Additives

□□North America Radiation Cured Coatings Market, By Application:

- o Adhesives
- o Pulp and Paper
- o Printing Inks
- o Wood
- o Glass
- o Others

□□North America Radiation Cured Coatings Market, By Country:

- o United States
- o Mexico
- o Canada

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the North America Radiation Cured Coatings Market.

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North America Radiation Cured Coatings 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:

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