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Crosslinking Agent Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, 2018-2028 Segmented By Chemistry (Amino, Amine, Isocyanate, Amide, Aziridine, Carbodiimide, Others), By Application (Decorative Coatings, Transportation Coatings, Industrial Wood Coatings, Protective Coatings, Marine Coatings, Can/Coil Coatings, Others), By Region, and Competition

https://marketpublishers.com/r/CC61E29DDFB3EN.html
Date: October 2023
Pages: 185
Price: US$ 4,900.00 (Single User License)
ID: CC61E29DDFB3EN

Abstracts

The Global Crosslinking Agent Market recorded a valuation of USD 7.38 billion in 2022 and is poised for significant growth during the forecast period, with an anticipated Compound Annual Growth Rate (CAGR) of 4.80% through 2028. The market is expected to reach USD 9.69 billion by 2028.

Crosslinking is a fundamental chemical process that involves creating bonds between polymer chains, whether they are synthetic or natural. This process results in polymers losing their ability to move independently as individual chains, as the added crosslinks restrict their mobility. Crosslinking holds substantial importance in both synthetic polymer chemistry and biological sciences.

One of the primary drivers behind the growth of the crosslinking agent market is the increasing use of powder coatings on a global scale. The demand for crosslinking agents is particularly high in the realm of water-based coatings and in the broader painting and coatings industries. These agents are widely employed in diverse industrial applications, including high-performance coatings, floor coatings, and heat-resistant paints. Additionally, the market benefits from increased investments and rapid

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industrialization.

Moreover, there is a growing demand for environmentally friendly crosslinking agents, presenting lucrative opportunities for market players from 2022 to 2029.

However, the presence of self-crosslinking agents, which can initiate crosslinking reactions independently, poses a challenge. These agents, also known as autocatalytic agents, can raise environmental and health concerns, but they also offer innovative solutions for reducing volatile organic compound (VOC) emissions in coatings.

Another challenge is the volatility in raw material prices, which can significantly affect production costs and overall profitability.

Key Market Drivers

Growing Demand for Crosslinking Agents in the Construction Industry: Crosslinking agents play a pivotal role in the construction industry, driving the growth of the global market. As the construction sector expands and the demand for durable and high-performance materials increases, effective crosslinking agents become indispensable. These agents are used to enhance material properties such as durability, strength, and resistance to heat, chemicals, and weathering. Urbanization, population growth, and infrastructure projects worldwide have fueled the demand for crosslinked polymers in construction applications. For instance, crosslinked polyethylene (PEX) pipes are widely used in plumbing and HVAC systems due to their flexibility and corrosion resistance. To meet stringent building codes and regulations, construction materials must exhibit improved performance and durability, and crosslinking agents enable the production of such materials.

Growing Demand for Crosslinking Agents in the Automotive and Electronics Sectors: The automotive industry's pursuit of lighter, safer, and more efficient vehicles has driven the demand for crosslinking agents. These agents enable the use of lightweight materials in automotive manufacturing, enhancing fuel efficiency and reducing carbon emissions. Materials like crosslinked polyethylene foam offer mechanical strength and impact resistance while reducing vehicle weight. Crosslinking agents are also crucial for producing materials with properties like high-temperature resistance, chemical resistance, and flame retardancy, vital for automotive components like wiring harnesses and gaskets. The electronics industry's drive for miniaturization and improved performance has also led to increased demand for crosslinking agents, particularly in wire and cable insulation, connectors, and encapsulation materials. These agents

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ensure the reliability of electronic systems by providing electrical insulation and protection against environmental factors.

Increasing Demand for Paints and Coatings: The rising demand for advanced coatings across various applications necessitates reliable crosslinking agents. These agents enhance the durability, adhesion, chemical resistance, and overall performance of coatings. They facilitate the formation of strong bonds within the coating matrix, ensuring long-lasting protection. With extensive urbanization and infrastructure development projects globally, there's a significant need for coatings that withstand harsh environmental conditions. Construction projects require high-performance coatings that endure extreme weather, UV radiation, and chemical exposure, ensuring longevity and reduced maintenance costs. The incorporation of crosslinking agents in high-performance coatings is vital to meet the growing demand for coatings that provide durability and longevity in various applications.

Key Market Challenges

Presence of Self-Crosslinking Agents: The presence of self-crosslinking agents presents a challenge in the crosslinking agent market. These agents can initiate crosslinking reactions independently, raising environmental and health concerns. However, they also offer innovative solutions for reducing volatile organic compound (VOC) emissions in coatings. Stricter regulations on VOC emissions have driven the adoption of self-crosslinking technologies, especially in North America and Europe.

Volatility in Prices of Raw Materials: Fluctuations in raw material prices can significantly impact production costs and profitability in the crosslinking agent market. Raw materials include chemicals, resins, solvents, and additives. Factors like supply-demand dynamics, economic conditions, geopolitical events, and natural disasters contribute to raw material price volatility. These fluctuations disrupt production planning, inventory management, and pricing strategies, affecting the financial health of companies in the market. Rapid changes in raw material prices can disrupt the supply chain, leading to potential delays and strained customer relationships.

Key Market Trends

Growth in Technological Advancements: Technological advancements have revolutionized crosslinking agent development. Research and development efforts have led to the precise customization of crosslinking agents to meet specific application requirements. Innovative synthesis methods, such as catalytic processes and

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sustainable manufacturing techniques, are gaining prominence. Automation and robotics have improved production efficiency and consistency, reducing the risk of human error.

Segmental Insights

Chemistry Insights: The Amino segment dominated the market in 2022 and is expected to continue growing. Amino crosslinking agents are widely used in both industrial and decorative coatings. The Isocyanate segment is projected to witness significant growth due to its diverse applications in automotive, decorative, appliances, packaging, and industrial wood coatings.

Application Insights: Transportation coatings dominated the market in 2022, driven by the need for coatings that meet stringent requirements in the automotive, aerospace, and marine sectors. The demand for environmentally compliant coatings is expected to drive growth in this segment.

Regional Insights: The Asia Pacific region leads the Global Crosslinking Agent Market. High economic growth, rising income, and population growth have fueled demand in developing countries. Established manufacturing industries in countries like Japan, India, China, and South Korea drive significant regional growth.

Key Market Players

BASF SE

Allnex GMBH

Covestro AG

Evonik Industries AG

Huntsman International LLC

Dow Inc.

Wanhua Chemical Group Co. Ltd.

Nisshinbo Chemical Inc.

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Mitsubishi Chemical Corporation

Report Scope:

In this report, the Global Crosslinking Agent Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Crosslinking Agent Market, By Chemistry:

Amino

Amine

Isocyanate

Amide

Aziridine

Carbodiimide

Others

Crosslinking Agent Market, By Application:

Decorative Coatings

Transportation Coatings

Industrial Wood Coatings

Protective Coatings

Marine Coatings

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Can/Coil Coatings

Others

Crosslinking Agent Market, By Region:

Asia Pacific

North America

Europe

Middle East & Africa

South America

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Crosslinking Agent Market.

Available Customizations:

Global Crosslinking Agent Market report with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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