

United States Automotive Adhesives Market By Resin Type (PU, Epoxy, Acrylic, Silicone, SMP, MMA), By Vehicle Type (Passenger Cars, LCVS, Trucks, Buses, Others), By Region, Competition Forecast & Opportunities, 2018-2028F

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Abstracts

The United States Automotive Adhesives Market was valued at USD 8.2 billion in 2022 and is projected to witness robust growth in the forecast period, with a CAGR of 5.24% through 2028. The automotive industry in the United States is a dynamic and thriving sector that constantly pursues innovations to enhance vehicle performance, safety, and durability. Automotive adhesives play a critical role in this pursuit by providing secure bonding solutions for various components and materials used in vehicle manufacturing. Over the years, the United States automotive adhesives market has experienced significant growth, driven by advancements in adhesive technology, stringent safety regulations, and the increasing demand for lightweight and fuel-efficient vehicles. Among the primary drivers for the escalating use of automotive adhesives is the industry-wide focus on weight reduction and improving fuel efficiency. These adhesives are extensively utilized in the assembly of the vehicle's body structure, bonding various components, including panels, pillars, roofs, and doors, thereby ensuring structural integrity and enhancing crash performance. Additionally, adhesives contribute to noise reduction and improved vibration damping. Moreover, adhesives are employed in attaching interior trim components, such as dashboard panels, center consoles, and door panels.

Key Market Drivers:

The growing utilization of water-based automotive adhesives is driving the overall market. Water-based adhesives offer adaptable and high-tech bonding solutions to

meet the demands of challenging applications in the automobile industry. They are particularly suitable for automotive interior assembly applications. These adhesives are formulated by combining water, polymers, and additives, and they work effectively on both porous and non-porous substrates. Water-based adhesives can be formulated as solutions, which become active as the water evaporates or the substrate absorbs it. When employing high-quality water-based adhesives, manufacturers not only enjoy the advantages of solvent-based adhesives but also benefit from reduced costs and VOC levels. Moreover, water-based adhesives are safer to use and more environmentally friendly compared to solvent-based alternatives. They contribute to a healthier working environment for automobile assembly line workers by reducing the emission of harmful gases and VOCs, ultimately improving indoor air quality and reducing the risk of respiratory problems and other health issues.

The market is also witnessing a rise in the demand for methyl methacrylate adhesives (MMAs). These adhesives offer the combined strength of a structural adhesive along with a unique snap-cure property, making them suitable for application across large areas and varied materials in the automobile industry. Unlike other adhesives, MMAs quickly harden to a fixed strength without the need for a gradual curing process. This allows for efficient application on large panels of heavy trucks or equipment, resulting in significant time savings during production. The customizable open workable time and curing time of MMAs further enhance their versatility in specific applications. The increasing adoption of MMAs in the automobile industry is driving the overall market.

Furthermore, there is a notable increase in the use of environmentally friendly automotive adhesives, which aligns with the growing focus on sustainability and environmental consciousness in the industry.

Green adhesives are predominantly formulated by excluding all chemicals except organic substances. In order to comply with stringent environmental regulations and ensure safety, there is a growing demand in the United States for environmentally friendly automotive adhesives. Companies are primarily focusing on substituting solvents with ecologically friendly alternatives. Green adhesives offer a stronger and more durable bond for automobiles compared to mechanical fasteners, as they are rust-free and reduce the risk of water and snow penetration. Moreover, low-VOC adhesives have been developed to prevent health issues caused by exposure to hazardous components in traditional materials. As consumers seek improved air quality, the latest trend is to eliminate volatile organic compound emissions from the cabin of new vehicles. To meet the specialized bonding requirements of the automotive industry and achieve low VOC performance, leading automotive adhesive manufacturers are

primarily focusing on UV-cured and emulsion acrylic adhesives.

Shifting Automotive Sensor Applications from Epoxy-Based to New Silicone-Based Electrically Conductive Adhesives

Automotive electronic specialists require highly durable adhesives that can withstand harsh environments. In the past, automotive sensor applications relied on older generation electrically conductive adhesives based on epoxy. These epoxy-based adhesives demonstrated greater vibrational energy but had limited resilience to high temperatures. To address these limitations, new silicone-based electrically conductive adhesives are being developed. These adhesives not only offer electrical resistance, adhesion, and flexibility, but also exhibit tolerance to operating temperatures as high as 200 degrees Celsius.

Key Market Challenges

Rising Raw Material Costs

The automotive industry of the United States has long been recognized as a powerhouse of innovation and technological advancements, with a steadfast commitment to sustainability and safety. However, the industry is confronted with a significant challenge in the form of escalating raw material costs. Fluctuations in oil prices, geopolitical tensions, and disruptions in the supply chain have collectively contributed to the mounting expenses associated with key components like resins, solvents, and additives, which are fundamental to automotive adhesives. These unprecedented cost hikes place immense pressure on manufacturers and end-users alike. While larger enterprises may have the advantage of economies of scale to manage higher material costs, smaller adhesive manufacturers and Small and Medium-Sized Enterprises (SMEs) face more profound implications. These SMEs may struggle to absorb or offset such costs due to their limited scale, potentially leading to financial strain or even market exit. Consequently, reduced competition and innovation within the industry become inevitable outcomes.

Complexities in Design and Manufacturing

In the pursuit of lightweight vehicles and enhanced fuel efficiency, the automotive industry has increasingly adopted diverse materials like aluminum, composites, high-strength steels, and plastics in vehicle designs. While these materials offer distinct advantages, they also present unique challenges in terms of joining methods.

Traditional welding and fastening techniques may not be suitable for all these materials, thus making adhesives the preferred choice. Even minor deviations in adhesive thickness or distribution can significantly impact the performance and integrity of the bond. Automotive manufacturers must invest in specialized equipment and skilled personnel to ensure precise and consistent application techniques throughout the production process. Additionally, adhesives typically require a curing process that varies depending on the adhesive type and environmental conditions. Lengthy curing times can impede production efficiency, leading to increased costs.

Key Market Trends

Advancements in Composite Bonding

The automotive industry in the United States has been undergoing a remarkable transformation, driven by a shift towards lightweight materials and the increasing adoption of electric and hybrid vehicles. Composites have gained significant popularity in the automotive sector due to their exceptional strength-to-weight ratio. Carbon fiber-reinforced polymers (CFRPs) are particularly renowned for their high tensile strength, stiffness, and corrosion resistance. By incorporating composites into vehicle structures and components, automakers can achieve substantial weight reduction, leading to improved fuel efficiency and overall performance enhancement. To meet the requirements of modern vehicle design, adhesive manufacturers are investing heavily in research and development to create specialized bonding solutions tailored for composites. One crucial requirement for bonding composites is the ability to evenly distribute stress across the joint. Adhesives offer a flexible and uniform bond line, effectively distributing mechanical loads and minimizing the risk of localized failure. This even stress distribution is vital for maintaining the structural integrity of composite components and ensuring long-term durability. Another notable advancement in bonding composites is the development of hybrid bonding solutions, which combine adhesive bonding with other joining techniques such as mechanical fastening or welding. This approach leverages the strengths of each method while compensating for their respective weaknesses. The combination of techniques enables automakers to design structures that are both lightweight and mechanically robust, addressing the challenges posed by the unique properties of composites.

Digitalization and industrialization play crucial roles in the automotive adhesives market. Digital tools such as computer-aided design (CAD) and simulation software streamline the product development process, reducing experimentation and prototyping time. Automotive manufacturers can utilize digitalization to monitor adhesive application

equipment and predict maintenance needs. Smart sensors and monitoring systems collect real-time data, helping manufacturers anticipate equipment failures or deterioration, thus reducing downtime and improving production efficiency. Robotic systems equipped with precision adhesive dispensing capabilities are increasingly prevalent in automotive assembly lines, ensuring consistent adhesive application, reducing human errors, and enhancing production efficiency. Moreover, industrialization enables adhesive manufacturers to implement in-line quality control processes during production. Automated inspection systems assess adhesive bead dimensions, distribution, and cure time, ensuring adherence to strict quality standards. Digitalization and industrialization also contribute to environmental sustainability within the automotive adhesives market. Data-driven research and development processes facilitate the formulation of eco-friendly adhesives with reduced volatile organic compound (VOC) emissions and improved recyclability. Furthermore, industrialization enables optimized adhesive application, reducing waste and minimizing environmental impact.

Segmental Insights:

Resin Type Insights:

In 2022, the MMA segment dominated the automotive adhesives market and is predicted to continue expanding in the coming years. MMA adhesives offer excellent adhesion to various substrates, including metals, composites, and plastics. They provide high bond strength, ensuring durable and reliable bonds in automotive applications. MMA adhesives exhibit excellent resistance to impact, vibration, and environmental factors such as temperature changes and moisture, making them suitable for automotive applications exposed to challenging conditions.

Vehicle Type Insights:

In 2022, the passenger cars segment dominated the automotive adhesives market and is expected to continue expanding in the coming years. Cars are the preferred mode of transportation in developed nations, and their popularity is growing in developing nations due to rising incomes. The availability of vehicle financing has been driving the car industry, as customers can obtain loans to purchase their own cars. In many developing nations, owning a car is considered a symbol of social status. These trends, along with the anticipated growth of car ownership in developing nations, have created a demand for automotive adhesives in the market.

Regional Insights

The Midwest region has positioned itself as the leading hub in the United States Automotive Adhesives Market. With numerous major automobile manufacturers and assembly plants based in the Midwest, adhesive manufacturers in the region enjoy a vast customer base. Regions that boast well-established research and development centers focused on automotive technologies and materials, including adhesives, foster innovation and attract key industry players. These centers play a pivotal role in driving the development of advanced adhesive solutions tailored specifically for automotive applications. Additionally, the Midwest's central location in the United States offers logistical advantages for companies operating in the region.

Key Market Players

H.B. Fuller

Permabond LLC

3M Company

Henkel AG & Co. KGaA

Huntsman Corporation

Sika AG

Arkema S.A.

DuPont de Nemours, Inc.

Uniseal, Inc.

Dow Inc.

Report Scope:

In this report, the United States Automotive Adhesives Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

United States Automotive Adhesives Market By Resin Type (PU, Epoxy, Acrylic, Silicone, SMP, MMA), By Vehicle T...

United States Automotive Adhesives Market, By Resin Type:

PU

Epoxy

Acrylic

Silicone

SMP

MMA

United States Automotive Adhesives Market, By Vehicle Type:

Passenger Cars

LCVS

Trucks

Buses

Others

United States Automotive Adhesives Market, By Region:

North-East

Mid-West

West

South

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the United States Automotive Adhesives Market.

Available Customizations:

United States Automotive Adhesives 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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