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Automotive Shielding Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, 2018-2028 Segmented By Vehicle Type (Passenger car and Commercial Vehicle), By Shielding Type (Heat Shielding and Electromagnetic Induction Shielding), By Regional, Competition

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Abstracts

Global Automotive Shielding Market has valued at USD 21 billion in 2022 and is anticipated to project robust growth in the forecast period with a CAGR of 3.8%. The Global Automotive Shielding Market is experiencing significant growth, driven by the continuing evolution of vehicle electronics and the increasing demand for fuel-efficient automobiles. As vehicle technology advances, the integration of electronic components has become more prevalent, leading to a surge in the necessity for automotive shielding. This shielding is crucial in preventing electromagnetic interference, ensuring optimal vehicle safety, and enhancing overall performance.

Moreover, the market is further propelled by the rapid advancements in electric and hybrid vehicles worldwide. With the automotive industry's increasing focus on sustainable and eco-friendly transport solutions, the demand for automotive shielding is set to rise even higher.

Key players in this field include Federal-Mogul Corporation, Laird PLC, Morgan Advanced Materials, Henkel AG & Co. KGaA, Dana Inc., and others. These companies are at the forefront of innovation, continuously developing new and improved shielding solutions to cater to the evolving needs of the automotive industry.

Despite the ongoing challenges posed by the global pandemic, the Automotive

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Shielding Market remains resilient and shows a promising future. The industry's relentless pursuit of innovation, coupled with the escalating demand for environmentally friendly transport solutions, ensures that the market will continue to thrive in the coming years.

Key Market Drivers

Electrification of Vehicles

The electrification of vehicles, including electric vehicles (EVs) and hybrid vehicles, is a primary driver of the Automotive Shielding Market. EVs are equipped with advanced electronic systems, including electric powertrains, battery management systems, and onboard chargers, which generate electromagnetic interference. To ensure the proper functioning of these systems and prevent EMI-related issues, automotive shielding is essential. As the adoption of electric and hybrid vehicles continues to rise, the demand for effective shielding solutions is expected to grow in parallel.

Increasing Electronic Content

Modern vehicles are equipped with an unprecedented level of electronic content, encompassing advanced driver assistance systems (ADAS), infotainment systems, telematics, and connectivity features. These electronic components are susceptible to EMI and RFI, which can interfere with their operation. Automotive shielding solutions, such as EMI gaskets, conductive coatings, and electromagnetic shielding materials, are essential to mitigate interference and ensure the seamless performance of electronic systems. The proliferation of electronic content in vehicles is a significant driver of the market.

Connectivity and Autonomous Driving

The advancement of vehicle connectivity and the development of autonomous driving technologies are driving the demand for automotive shielding. Connected vehicles rely on wireless communication systems such as Wi-Fi, Bluetooth, and cellular networks, making them susceptible to RFI. Autonomous vehicles, equipped with radar, lidar, and sensor systems, require robust shielding to prevent interference and maintain safety-critical functionality. As connectivity and autonomous driving become integral to the automotive landscape, shielding solutions are indispensable for ensuring reliable performance.

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Stringent Emissions Standards

Stringent emissions standards are a key driver of the Automotive Shielding Market. To meet emissions regulations, automakers are employing advanced exhaust aftertreatment systems, including selective catalytic reduction (SCR) and diesel particulate filters (DPF). These systems generate high temperatures and require effective thermal shielding to manage heat and prevent damage to surrounding components. Automotive shielding materials and solutions are essential for achieving compliance with emissions standards while maintaining vehicle performance.

Lightweighting Initiatives

The automotive industry's focus on lightweighting to improve fuel efficiency and reduce emissions has implications for shielding solutions. Lightweight materials, including aluminum and composite alloys, are being used in vehicle construction. Automotive shielding components and materials must be designed to be lightweight while still effectively providing EMI, RFI, and thermal protection. Achieving this balance between weight reduction and shielding performance is a challenge for manufacturers but is crucial in the context of industry-wide lightweighting initiatives.

Advancements in Electric Powertrains

The evolution of electric powertrains presents unique challenges related to EMI and thermal management. Electric motors, inverters, and power electronics generate electromagnetic fields and heat that must be controlled to ensure the efficient operation of EVs. Automotive shielding solutions, such as electromagnetic interference shielding for high-voltage components and thermal barriers, are instrumental in maintaining the reliability and safety of electric powertrains. The rapid development of electric propulsion technologies drives the need for innovative shielding solutions.

Advanced Driver Assistance Systems (ADAS)

The integration of ADAS, including radar, lidar, and camera-based systems, is becoming commonplace in modern vehicles. These systems rely on sensor technology to enhance safety and provide features like adaptive cruise control and collision avoidance. Effective shielding is critical to prevent interference and maintain the accuracy and reliability of ADAS components. As ADAS adoption continues to grow, automotive shielding becomes integral to the functionality and safety of these systems.

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Noise, Vibration, and Harshness (NVH) Control

Noise, vibration, and harshness control is a critical aspect of vehicle design and customer comfort. Automotive shielding materials are used to reduce NVH levels by dampening vibrations and blocking unwanted noise from entering the vehicle cabin. As consumers demand quieter and more refined vehicles, the role of shielding in NVH control becomes increasingly important, driving its incorporation into vehicle design and manufacturing.

Research and Development (R&D) Initiatives

Investments in R&D play a vital role in advancing automotive shielding technologies. Manufacturers are continuously developing innovative shielding materials, coatings, and solutions to address evolving challenges. Collaborations between automakers, tier-one suppliers, and material scientists drive innovation in the field. Ongoing R&D efforts focus on improving the effectiveness of shielding solutions, optimizing materials, and developing new techniques for integration.

Globalization of Automotive Production

The globalization of automotive production has implications for the Automotive Shielding Market. Automotive manufacturers often operate on a global scale, producing vehicles in multiple regions. This necessitates standardized shielding solutions that can be implemented across different markets and regulatory environments. The globalization of production drives the demand for consistent, high-quality shielding components on a global scale.

Regulatory Compliance

Meeting regulatory compliance standards is a fundamental driver of the Automotive Shielding Market. Regulatory bodies and agencies impose electromagnetic compatibility (EMC) standards and emissions regulations that require vehicles to demonstrate compliance with EMI/RFI limits and thermal management requirements. Automotive shielding solutions are integral to ensuring compliance with these standards, supporting automakers in meeting legal and safety requirements.

Key Market Challenges

Electrification Complexity

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The electrification of vehicles, including electric vehicles (EVs) and hybrid vehicles, introduces complexities in automotive shielding. These vehicles use high-voltage systems, inverters, and electric motors that generate electromagnetic fields. Shielding these components effectively without adding excessive weight is a challenge. Additionally, as the adoption of EVs and hybrids continues to grow, the demand for shielding solutions tailored to these vehicles becomes more critical.

Integration with Advanced Materials

As the automotive industry embraces lightweighting initiatives to improve fuel efficiency and reduce emissions, shielding materials must integrate seamlessly with advanced lightweight materials. Lightweight components made from aluminum alloys, composites, and high-strength steel are increasingly used in vehicle construction. Ensuring that shielding materials effectively adhere to and complement these lightweight materials while still providing EMI and RFI protection poses a challenge.

Compatibility with Autonomous Systems

The development of autonomous vehicles relies on an array of sensors, including radar, lidar, cameras, and ultrasonic sensors, to perceive the environment and make real-time decisions. Automotive shielding must be designed to minimize interference with these sensors and ensure their accuracy. Achieving compatibility between shielding materials and autonomous systems is a complex task, especially as sensor technologies evolve.

Thermal Management for EV Batteries

In EVs, thermal management is crucial for battery safety and performance. High-capacity lithium-ion batteries generate significant heat during charging and discharging, requiring efficient thermal shielding to manage temperature levels. The challenge lies in developing thermal shielding solutions that can withstand the extreme temperatures while ensuring the safety and longevity of the battery packs.

Lightweighting vs. Shielding Effectiveness

Balancing the demand for lightweighting with the need for effective shielding is a fundamental challenge in the Automotive Shielding Market. While lightweight materials reduce vehicle weight and improve fuel efficiency, they may not inherently possess the electromagnetic or thermal shielding properties required. Manufacturers must engineer

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solutions that maintain or enhance shielding effectiveness while adhering to lightweighting goals.

Compatibility with Connectivity

Modern vehicles rely on advanced connectivity systems that use wireless technologies such as Wi-Fi, Bluetooth, and cellular networks. These systems are susceptible to RFI, which can disrupt communication and compromise safety features. Automotive shielding solutions must effectively mitigate RFI without impeding connectivity. Ensuring compatibility between shielding and connectivity technologies is a challenge for engineers and designers.

Materials Innovation

The challenge of developing new materials with improved shielding properties persists in the industry. Automotive shielding materials must meet stringent performance requirements while being cost-effective and environmentally sustainable. Researchers and manufacturers continually seek innovative materials that offer enhanced shielding performance, which requires significant investments in research and development.

Regulatory Compliance

Meeting regulatory compliance standards for electromagnetic compatibility (EMC) and emissions is an ongoing challenge. Regulatory bodies impose strict standards to ensure that vehicles do not emit harmful EMI and RFI that can interfere with critical systems, including other vehicles' electronics and communication systems. Automotive manufacturers must invest in testing and validation to demonstrate compliance with these standards.

Noise, Vibration, and Harshness (NVH) Control

Shielding materials used for EMI and RFI protection may have unintended consequences on vehicle noise, vibration, and harshness (NVH) levels. Excessive shielding or improper application can contribute to unwanted vibrations or amplify noise, leading to a less comfortable driving experience. Balancing shielding effectiveness with NVH control is a challenge that requires precise engineering and testing.

Compatibility with Emerging Technologies

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As the automotive industry explores emerging technologies, such as 5G connectivity and vehicle-to-everything (V2X) communication, automotive shielding must evolve to ensure compatibility. These technologies introduce new challenges related to interference and signal integrity that shielding solutions must address effectively.

Global Supply Chain Disruptions

The COVID-19 pandemic highlighted the vulnerability of global supply chains. Automotive shielding manufacturers rely on a complex network of suppliers for materials and components. Disruptions in the supply chain, whether due to pandemics, geopolitical tensions, or natural disasters, can impact the availability of critical shielding materials, affecting production timelines and costs.

Cost Considerations

Cost-effectiveness is a perennial challenge in the Automotive Shielding Market. Automotive manufacturers seek solutions that offer the required shielding performance without significantly increasing production costs. Achieving a balance between shielding effectiveness, material costs, and manufacturing processes is essential to maintain competitiveness.

Intellectual Property Protection

Protecting intellectual property related to innovative shielding designs and materials is vital in a competitive market. Companies invest in robust IP protection measures and legal safeguards to prevent reverse engineering and IP infringement, safeguarding their unique shielding solutions.

Sustainability and Environmental Regulations

Growing environmental awareness and regulations drive the demand for sustainable materials and manufacturing processes in the automotive industry. Shielding manufacturers face the challenge of adopting eco-friendly materials and processes while maintaining performance and compliance with environmental regulations.

Key Market Trends

Rising Electrification of Vehicles

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One of the most prominent trends in the automotive industry is the rapid electrification of vehicles. Electric vehicles (EVs) have gained substantial market share, driven by increasing environmental concerns and government incentives. This transition has fueled the demand for advanced electromagnetic interference (EMI) shielding solutions to protect sensitive electronic components in EVs from interference. As EVs become more mainstream, the automotive shielding market is expected to grow significantly to meet the unique EMI and thermal management challenges presented by electric powertrains.

Integration of Advanced Driver Assistance Systems (ADAS)The integration of advanced driver assistance systems, such as lane-keeping assist, adaptive cruise control, and autonomous emergency braking, has become increasingly common in modern vehicles. These systems rely heavily on sensors and radar technologies, making EMI shielding a critical consideration. The automotive shielding market has witnessed a surge in demand for materials and solutions that can effectively shield these sensitive sensors and ensure their uninterrupted operation, contributing to vehicle safety and automation.

Lightweight Shielding Materials

In an era where vehicle manufacturers are constantly striving to improve fuel efficiency and reduce emissions, the demand for lightweight shielding materials has risen significantly. Traditional metal-based shielding materials are heavy and can negatively impact a vehicle's overall weight and fuel economy. As a result, innovative lightweight materials, such as conductive plastics and composite materials, have gained traction in the market. These materials offer effective EMI shielding while minimizing the added weight, aligning with the industry's pursuit of lightweighting.

Stringent Emission Standards and Regulations

Global emissions regulations have become increasingly stringent, pushing automotive manufacturers to develop more fuel-efficient vehicles and reduce emissions. As a result, there is a growing need for thermal shielding solutions that can manage heat generated by various vehicle components, especially in hybrid and electric vehicles. The automotive shielding market has responded with innovative thermal management solutions that help manufacturers meet regulatory requirements while maintaining vehicle performance.

Increasing Focus on Passenger Comfort and Safety

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Vehicle occupants' comfort and safety have always been top priorities for automakers. With the rise of electric vehicles, there is a heightened emphasis on reducing noise, vibration, and harshness (NVH) to enhance passenger comfort. Additionally, the automotive industry is witnessing the emergence of advanced safety features like vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication, which require effective shielding to ensure seamless and secure connectivity.

Global Supply Chain Disruptions

The global automotive industry has been impacted by supply chain disruptions, primarily due to the COVID-19 pandemic and its ongoing effects. These disruptions have caused shortages in various automotive components, including shielding materials. As a result, automotive manufacturers are looking for ways to diversify their supply chains and ensure a consistent flow of shielding materials to avoid production delays.

Customization and Integration

Automakers are increasingly seeking customizable and integrated shielding solutions that can be seamlessly incorporated into vehicle design and assembly. This trend reflects a growing desire to optimize space, reduce assembly complexity, and enhance overall vehicle performance. Suppliers in the automotive shielding market are responding by offering bespoke solutions that cater to the unique needs of each vehicle model.

Rising Demand in Emerging Markets

Emerging markets, particularly in Asia-Pacific and Latin America, are experiencing robust growth in the automotive industry. Rising disposable incomes, urbanization, and increased mobility have contributed to a surge in vehicle sales. This has led to higher demand for automotive shielding products in these regions as manufacturers aim to meet the safety and performance expectations of their expanding customer base.

Shift Towards Sustainable Materials

Environmental concerns are driving the automotive industry to adopt more sustainable materials and production processes. In response, the automotive shielding market has witnessed a shift towards the development and utilization of eco-friendly materials that have a reduced environmental impact. Manufacturers are increasingly looking for shielding solutions that align with their sustainability goals.

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Investments in Research and Development

To stay competitive in a rapidly evolving automotive landscape, companies in the automotive shielding market are investing heavily in research and development. This includes the development of innovative materials, advanced manufacturing techniques, and cutting-edge testing methods to ensure the highest levels of performance and reliability in shielding solutions.

Segmental Insights

Shielding Type Insights

The global automotive shielding market can be categorized into two primary shielding types - heat shielding and electromagnetic interference (EMI) shielding. Heat shielding is designed to protect vehicle components from extreme temperatures, thereby enhancing vehicle performance and lifespan. On the other hand, EMI shielding is tailored to prevent electronic components from electromagnetic interference, which can jeopardize the vehicle's functionality and safety. Market trends indicate a rising demand for both types of shielding, fueled by the growing complexity of vehicle designs and the increasing incorporation of electronics in modern cars.

Vehicle Type Insights

The global Automotive Shielding market is segmented into various vehicle types including passenger cars, light commercial vehicles (LCVs), and heavy commercial vehicles (HCVs). Passenger cars currently dominate the market share given their high production volumes globally and the increased emphasis on implementing advanced safety and comfort features. The market for LCVs and HCVs is also expected to witness growth due to the rise in transport activities and the need for vehicle efficiency, driving the demand for effective automotive shielding. Notably, the increasing adoption of hybrid and electric vehicles presents a substantial growth opportunity for the Automotive Shielding market due to the necessity of shielding in these vehicle types to prevent electromagnetic interference.

Regional Insights

The global automotive shielding market is witnessing marked regional disparities. In North America, advancements in automotive electronics coupled with stringent

regulatory standards for vehicle safety and fuel efficiency are propelling market growth. Europe, with its strong automotive sector and focus on electric vehicles, is also a significant contributor to the market. Asia-Pacific, particularly China and India, is expected to exhibit robust growth in the automotive shielding market due to increasing vehicle production and mounting concerns about vehicle emissions. However, Africa and the Middle East, while showing potential, are still nascent markets, with growth impeded by factors such as limited industrial infrastructure and economic instability.

Key Market Players

Tenneco Inc.

Liard Plc

Henkel

Morgan Advanced Material

3M

Dana Incorporated

RTP Company

Marian Inc.

Autoneum

Parker Hannifin

Report Scope:

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

Automotive Shielding Market, By Vehicle Type:

Passenger car

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- Commercial Vehicle

Automotive Shielding Market, By Shielding Type:

- Heat Shielding
- Electromagnetic Induction Shielding

Automotive Shielding Market, By Region:

- North America
  - United States
  - Canada
  - Mexico
- Europe & CIS
  - Germany
  - Spain
  - France
  - Russia
  - Italy
  - United Kingdom
  - Belgium
- Asia-Pacific
  - China

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India

Japan

Indonesia

Thailand

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

Turkey

Iran

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Automotive Shielding Market.

Available Customizations:

Global Automotive Shielding Market report with the given market data, Tech Sci

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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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