

Aerospace & Defence Elastomers Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, 2018-2028 Segmented By Type (EPDM, Fluoroelastomers, Silicone Elastomers, Others), By Application (O-Rings & Gaskets, Seals, Profiles, Hoses, Others), By Region and Competition

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Abstracts

Global Aerospace & Defence Elastomers Market has valued at USD72.34 million in 2022 and is anticipated to project robust growth in the forecast period with a CAGR of 4.73% through 2028. The monomers that link to a polymer are generally a fusion of various elements such as carbon, hydrogen, oxygen, and silicon. These monomers, when combined, form the backbone of polymers, giving them their unique properties and characteristics. Polymer materials play a crucial role in various industries, including aerospace and defense.

Speaking of elastomers, they are a specific type of polymer that exhibits rubber-like properties and have the ability to return to their original shape after being stretched or deformed. Elastomers are commonly used in applications where flexibility, resilience, and durability are required. For instance, they are widely utilized in seals, adhesives, and molded flexible parts in the aerospace and defense industry. These elastomers are engineered to withstand the temperatures above their glass transition temperature, making them suitable for demanding environments.

When it comes to aerospace and defense elastomers, they can be classified into different types, including Silicone Elastomers, Fluor elastomers, and Ethylene Propylene diene monomers. Silicone rubbers, a type of silicone elastomers, are known for their exceptional heat stability and electrical insulation properties. They find

applications in various forms, such as sheets, tapes, cable insulation coverings, extruded moldings, and coated glass-fiber materials. On the other hand, fluor elastomers are preferred for their chemical resistance and are commonly used in seals and barrier layers in harsh environments. Elastomers, in general, offer high elasticity with elongation values ranging from hundreds to thousands of percent, making them suitable for applications where low stiffness and high elasticity are desired, such as airplane tires, o-rings, and seals.

The demand for aerospace and defense elastomers has been driven by the ongoing trend of lighter aircraft, which requires advanced materials to meet the performance and safety requirements. Manufacturers in this industry are continuously improving the technology available to them, which is expected to enhance the quality of elastomer products and offerings in the market. The aviation industry, being the primary consumer, is significantly contributing to the growth of the aerospace and defense elastomers market. Additionally, the surging demand for new aircraft in advanced markets has further propelled the market's growth.

However, despite the positive growth prospects, the aerospace industry is subject to cyclical patterns, with each cycle lasting for about ten years. This cyclicity makes the economy vulnerable to the volatile global situation. Nevertheless, advancements in aeronautical technology, particularly in aircraft design features, along with increased defense spending by governments worldwide, are expected to drive market growth in the forecast period.

Another factor influencing the Aerospace and Defense Elastomers Market is the increasing replacement of existing aircraft with newer models across the globe. This trend not only drives the demand for elastomers but also presents opportunities for market growth throughout the projected period. However, challenges such as high maintenance costs and the funding required for manufacturing can hinder the market's growth. Furthermore, there is a need to raise awareness about the technological advancements and benefits offered by the Global Aerospace and Defense Elastomers Market.

In conclusion, the aerospace and defense elastomers market is driven by the demand for advanced materials in the aviation industry, the ongoing trend of lighter aircraft, and the replacement of existing aircraft with newer models. The industry's growth is supported by technological advancements, defense spending, and the need for high-performance elastomers in various applications. As the industry continues to evolve, there are opportunities to improve the quality and offerings of elastomer products while

addressing challenges such as maintenance costs and awareness.

Key Market Drivers

Expansion in Commercial Aviation

Commercial aviation plays a pivotal role in the global economy, serving as a vital catalyst for international trade, tourism, and business travel. In recent years, this sector has witnessed remarkable growth, propelled by factors such as burgeoning economies, an upsurge in disposable income, and a surging demand for air travel.

This exponential expansion in commercial aviation has, in turn, spurred an unprecedented demand for new aircraft and spacecraft, thus fueling the rapid growth of the aerospace and defense elastomers market. Elastomers, renowned for their exceptional properties like flexibility, durability, and resistance to heat and chemicals, find extensive utilization within the aerospace and defense industry. Seals, gaskets, hoses, and insulation are just a few of the myriad applications where elastomers are indispensable.

As the commercial aviation sector continues to soar, the demand for these elastomers is poised to witness a substantial surge. The proliferation of aircraft and spacecraft necessitates an increased requirement for various components, thereby driving the need for a greater supply of elastomers. Furthermore, the mounting emphasis on lightweight materials within the aerospace industry, aimed at enhancing fuel efficiency and reducing emissions, further augments the growth prospects of this market.

In conclusion, the growth and expansion of commercial aviation serve as significant drivers propelling the global aerospace and defense elastomers market. As this sector continues to flourish, it is expected to generate ample opportunities for manufacturers and suppliers in the elastomers market, cementing its position as a thriving and prosperous industry.

Growing Use of Elastomers in Sealing and Gasket Applications

Elastomers, renowned for their flexibility, durability, and exceptional resistance to heat and chemicals, have established themselves as indispensable materials in the aerospace and defense industry. With their remarkable properties, they are extensively utilized in critical components such as gaskets, seals, O-rings, hoses, and grommets, playing a pivotal role in ensuring safety, reliability, and optimal performance in

demanding environments.

In the aerospace sector, seals and gaskets crafted from elastomers hold paramount importance. These resilient components are employed in various static sealing applications where leak-proof performance is of utmost significance. From fuel systems and hydraulic systems to engine components and cabin pressurization systems, elastomeric seals and gaskets are relied upon to maintain integrity and prevent leakage, contributing to the overall safety and efficiency of aircraft operations.

The escalating adoption of elastomers in sealing and gasket applications continues to drive the demand for these versatile materials in the aerospace and defense industry. Market research indicates that the O-rings and gaskets segment is poised to witness substantial growth in the forthcoming years, propelled by the increasing number of aircraft deliveries and the rising need for maintenance, repair, and overhaul (MRO) services in the aerospace sector.

In conclusion, the growing reliance on elastomers in sealing and gasket applications serves as a significant driving force behind the expansion of the global aerospace and defense elastomers market. As the demand for these applications continues to surge, it is anticipated to fuel the overall growth of this market, presenting abundant opportunities for manufacturers and suppliers operating in this dynamic sector.

Key Market Challenges

Complexities Associated with Compatibility of Material

In the aerospace and defence industry, elastomers play a crucial role due to their impressive properties, including flexibility, durability, and exceptional resistance to heat and chemicals. These unique characteristics make them highly suitable for a wide range of applications, such as seals, gaskets, hoses, and many more.

However, despite their numerous advantages, the compatibility of elastomers with the diverse range of substances they come into contact with poses a significant challenge. This includes fuels, oils, hydraulic fluids, and even aggressive cleaning agents. Choosing the wrong type of elastomer can result in material degradation, which can ultimately compromise the safety and performance of the equipment.

The complexities associated with material compatibility have a profound impact on the aerospace and defence elastomers market. Manufacturers face the challenge of

carefully selecting the appropriate type of elastomer that can withstand the harsh conditions prevalent in aerospace and defence applications.

Furthermore, this issue becomes even more pronounced as aerospace manufacturers strive to reduce weight and increase fuel efficiency. As a result, new materials and fluids are being introduced, which may not be compatible with the existing elastomers.

Considering these intricate details and challenges, it becomes evident that meticulous attention must be given to the selection and testing of elastomers in order to ensure optimal performance and reliability in aerospace and defence applications.

Key Market Trends

Advancements in Elastomer Technologies

Elastomers, known for their exceptional flexibility, durability, and remarkable resistance to heat and chemicals, have emerged as indispensable materials in the aerospace and defence industry. These versatile materials find wide-ranging applications in critical components such as seals, gaskets, hoses, and beyond.

In recent years, the field of elastomer technologies has witnessed substantial advancements aimed at augmenting the performance characteristics of elastomers. The primary objective of these advancements is to make elastomers even more suitable for demanding applications within the aerospace and defence industry, where reliability and resilience are of utmost importance.

The ongoing advancements in elastomer technologies are profoundly impacting the aerospace and defence elastomers market. For instance, the development of novel elastomer materials with enhanced properties, such as superior resistance to extreme temperatures and harsh chemicals, is significantly expanding the potential applications of elastomers in this industry.

Moreover, the introduction of lightweight elastomers has emerged as a game-changer in the aerospace sector, where weight reduction is a critical objective to bolster fuel efficiency and curb emissions. These lightweight elastomers not only facilitate weight reduction but also maintain exceptional performance standards, making them highly sought after in the industry.

These technological advancements are not only elevating the performance of

aerospace and defence equipment but also serving as key drivers for the growth of the elastomers market. Manufacturers and suppliers in this sector are poised to benefit from these advancements, as they present new opportunities for innovation and expansion.

In conclusion, advancements in elastomer technologies represent a significant trend within the global aerospace and defence elastomers market. As these advancements continue to unfold, they are expected to fuel the growth of this market, opening up new avenues for manufacturers and suppliers to excel in this dynamic industry.

Segmental Insights

Type Insights

Based on the category of type, the others segment emerged as the dominant player in the global market for Aerospace & Defence Elastomers in 2022. Unsaturated elastomers, such as styrene-butadiene rubber, cis 1,4-polybutadiene, synthetic cis 1,4-polyisoprene, and natural rubber, are commonly used to enhance the ozone aging or oxidation resistance. These elastomers can be cured by the sulfur vulcanization process or, if desired, by non-sulfur vulcanization. It is worth noting that higher unsaturation levels yield better results.

In the preparation of blends, it is generally recommended to have an unsaturation level of the oil extended EPDM elastomer ranging from about 5-25 C=C/1000 C, preferably about 5-15 C=C/1000 C based on the total weight of the oil and EPDM elastomer. Interestingly, when the extender oil is added to the high Mooney EPDM elastomer in correlation with the initial unsaturation level of the elastomer, the resulting vulcanizates exhibit good physical properties. This correlation ensures that each unit weight of oil extended elastomeric material maintains the same unsaturation level as a suitable unextended elastomer.

Application Insights

The O-Rings & Gaskets segment is projected to experience rapid growth during the forecast period. O-rings, the most commonly used and widely available rubber sealing rings in the market, are essential components in various industries. Also known as packings or toric joints, O-rings are mechanical gaskets shaped like tori. They consist of a loop of elastomer with a round cross-section, designed to create a seal at the interface when seated in a groove and compressed between two or more parts during assembly.

These versatile sealing solutions find applications in both static and dynamic scenarios. In static applications, O-rings are used for fluid or gas sealing, where they are compressed to achieve zero clearance. The O-ring material is vulcanized solid, ensuring impermeability to the fluid or gas, while also possessing resistance to degradation caused by the medium.

In dynamic applications, O-rings play a crucial role in sealing mechanisms subjected to relative motion between parts. Examples include rotating pump shafts and hydraulic cylinder pistons. The flexibility and durability of O-rings enable them to maintain a reliable seal even in demanding environments.

With their wide range of materials and sizes available, O-rings offer versatility and efficiency in sealing applications across various industries, ensuring optimal performance and reliability.

Regional Insights

North America emerged as the dominant player in the Global Aerospace & Defence Elastomers Market in 2022, holding the largest market share in terms of value. Countries such as the United States, Canada, Mexico, and others are the major markets in this region, driven by the continuous upgradation and expansion of the aviation industry and the growing production of oil and gas. This region encompasses the world's top economy, the United States, which allocates significant investments in defense to continuously enhance its intelligence and defense priorities. The global aerospace industry, including regional jets, commercial aerospace, defense, space, and general aviation, constitutes a market worth several hundred billion dollars. Given the substantial size of the market and its promising long-term development prospects, the aerospace industry presents an exceedingly attractive opportunity for original equipment manufacturers (OEMs), material suppliers, engine suppliers, and part suppliers to thrive and succeed.

Key Market Players

Saint-Gobain Limited

LANXESS AG

Solvay SA

Dow Corning Ltd

Greene Inc

The Chemours Company

Wacker Chemie AG

Trelleborg AB

Momentive Performance Materials Inc

3M Company

Report Scope:

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

Aerospace & Defence Elastomers Market, By Type:

EPDM

Fluoroelastomers

Silicone Elastomers

Others

Aerospace & Defence Elastomers Market, By Application:

O-Rings & Gaskets

Seals

Profiles

Hoses

Others

Aerospace & Defence Elastomers Market, By Region:

North America

United States

Canada

Mexico

Europe

France

United Kingdom

Italy

Germany

Spain

Asia-Pacific

China

India

Japan

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Kuwait

Turkey

Egypt

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Aerospace & Defence Elastomers Market.

Available Customizations:

Global Aerospace & Defence Elastomers 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).

Contents

1. PRODUCT OVERVIEW

- 1.1. Market Definition
- 1.2. Scope of the Market
 - 1.2.1. Markets Covered
 - 1.2.2. Years Considered for Study
 - 1.2.3. Key Market Segmentations

2. RESEARCH METHODOLOGY

- 2.1. Objective of the Study
- 2.2. Baseline Methodology
- 2.3. Key Industry Partners
- 2.4. Major Association and Secondary Sources
- 2.5. Forecasting Methodology
- 2.6. Data Triangulation & Validation
- 2.7. Assumptions and Limitations

3. EXECUTIVE SUMMARY

- 3.1. Overview of the Market
- 3.2. Overview of Key Market Segmentations
- 3.3. Overview of Key Market Players
- 3.4. Overview of Key Regions/Countries
- 3.5. Overview of Market Drivers, Challenges, Trends

4. GLOBAL AEROSPACE & DEFENCE ELASTOMERS MARKET OUTLOOK

- 4.1. Market Size & Forecast
 - 4.1.1. By Value
- 4.2. Market Share & Forecast
 - 4.2.1. By Type (EPDM, Fluoroelastomers, Silicone Elastomers, Others)
 - 4.2.2. By Application (O-Rings & Gaskets, Seals, Profiles, Hoses, Others)
 - 4.2.3. By Region
 - 4.2.4. By Company (2022)
- 4.3. Market Map
 - 4.3.1. By Type

4.3.2. By Application

4.3.3. By Region

5. ASIA PACIFIC AEROSPACE & DEFENCE ELASTOMERS MARKET OUTLOOK

5.1. Market Size & Forecast

5.1.1. By Value

5.2. Market Share & Forecast

5.2.1. By Type

5.2.2. By Application

5.2.3. By Country

5.3. Asia Pacific: Country Analysis

5.3.1. China Aerospace & Defence Elastomers Market Outlook

5.3.1.1. Market Size & Forecast

5.3.1.1.1. By Value

5.3.1.2. Market Share & Forecast

5.3.1.2.1. By Type

5.3.1.2.2. By Application

5.3.2. India Aerospace & Defence Elastomers Market Outlook

5.3.2.1. Market Size & Forecast

5.3.2.1.1. By Value

5.3.2.2. Market Share & Forecast

5.3.2.2.1. By Type

5.3.2.2.2. By Application

5.3.3. Australia Aerospace & Defence Elastomers Market Outlook

5.3.3.1. Market Size & Forecast

5.3.3.1.1. By Value

5.3.3.2. Market Share & Forecast

5.3.3.2.1. By Type

5.3.3.2.2. By Application

5.3.4. Japan Aerospace & Defence Elastomers Market Outlook

5.3.4.1. Market Size & Forecast

5.3.4.1.1. By Value

5.3.4.2. Market Share & Forecast

5.3.4.2.1. By Type

5.3.4.2.2. By Application

5.3.5. South Korea Aerospace & Defence Elastomers Market Outlook

5.3.5.1. Market Size & Forecast

5.3.5.1.1. By Value

5.3.5.2. Market Share & Forecast

5.3.5.2.1. By Type

5.3.5.2.2. By Application

6. EUROPE AEROSPACE & DEFENCE ELASTOMERS MARKET OUTLOOK

6.1. Market Size & Forecast

6.1.1. By Value

6.2. Market Share & Forecast

6.2.1. By Type

6.2.2. By Application

6.2.3. By Country

6.3. Europe: Country Analysis

6.3.1. France Aerospace & Defence Elastomers Market Outlook

6.3.1.1. Market Size & Forecast

6.3.1.1.1. By Value

6.3.1.2. Market Share & Forecast

6.3.1.2.1. By Type

6.3.1.2.2. By Application

6.3.2. Germany Aerospace & Defence Elastomers Market Outlook

6.3.2.1. Market Size & Forecast

6.3.2.1.1. By Value

6.3.2.2. Market Share & Forecast

6.3.2.2.1. By Type

6.3.2.2.2. By Application

6.3.3. Spain Aerospace & Defence Elastomers Market Outlook

6.3.3.1. Market Size & Forecast

6.3.3.1.1. By Value

6.3.3.2. Market Share & Forecast

6.3.3.2.1. By Type

6.3.3.2.2. By Application

6.3.4. Italy Aerospace & Defence Elastomers Market Outlook

6.3.4.1. Market Size & Forecast

6.3.4.1.1. By Value

6.3.4.2. Market Share & Forecast

6.3.4.2.1. By Type

6.3.4.2.2. By Application

6.3.5. United Kingdom Aerospace & Defence Elastomers Market Outlook

6.3.5.1. Market Size & Forecast

- 6.3.5.1.1. By Value
- 6.3.5.2. Market Share & Forecast
 - 6.3.5.2.1. By Type
 - 6.3.5.2.2. By Application

7. NORTH AMERICA AEROSPACE & DEFENCE ELASTOMERS MARKET OUTLOOK

- 7.1. Market Size & Forecast
 - 7.1.1. By Value
- 7.2. Market Share & Forecast
 - 7.2.1. By Type
 - 7.2.2. By Application
 - 7.2.3. By Country
- 7.3. North America: Country Analysis
 - 7.3.1. United States Aerospace & Defence Elastomers Market Outlook
 - 7.3.1.1. Market Size & Forecast
 - 7.3.1.1.1. By Value
 - 7.3.1.2. Market Share & Forecast
 - 7.3.1.2.1. By Type
 - 7.3.1.2.2. By Application
 - 7.3.2. Mexico Aerospace & Defence Elastomers Market Outlook
 - 7.3.2.1. Market Size & Forecast
 - 7.3.2.1.1. By Value
 - 7.3.2.2. Market Share & Forecast
 - 7.3.2.2.1. By Type
 - 7.3.2.2.2. By Application
 - 7.3.3. Canada Aerospace & Defence Elastomers Market Outlook
 - 7.3.3.1. Market Size & Forecast
 - 7.3.3.1.1. By Value
 - 7.3.3.2. Market Share & Forecast
 - 7.3.3.2.1. By Type
 - 7.3.3.2.2. By Application

8. SOUTH AMERICA AEROSPACE & DEFENCE ELASTOMERS MARKET OUTLOOK

- 8.1. Market Size & Forecast
 - 8.1.1. By Value

8.2. Market Share & Forecast

8.2.1. By Type

8.2.2. By Application

8.2.3. By Country

8.3. South America: Country Analysis

8.3.1. Brazil Aerospace & Defence Elastomers Market Outlook

8.3.1.1. Market Size & Forecast

8.3.1.1.1. By Value

8.3.1.2. Market Share & Forecast

8.3.1.2.1. By Type

8.3.1.2.2. By Application

8.3.2. Argentina Aerospace & Defence Elastomers Market Outlook

8.3.2.1. Market Size & Forecast

8.3.2.1.1. By Value

8.3.2.2. Market Share & Forecast

8.3.2.2.1. By Type

8.3.2.2.2. By Application

8.3.3. Colombia Aerospace & Defence Elastomers Market Outlook

8.3.3.1. Market Size & Forecast

8.3.3.1.1. By Value

8.3.3.2. Market Share & Forecast

8.3.3.2.1. By Type

8.3.3.2.2. By Application

9. MIDDLE EAST AND AFRICA AEROSPACE & DEFENCE ELASTOMERS MARKET OUTLOOK

9.1. Market Size & Forecast

9.1.1. By Value

9.2. Market Share & Forecast

9.2.1. By Type

9.2.2. By Application

9.2.3. By Country

9.3. MEA: Country Analysis

9.3.1. South Africa Aerospace & Defence Elastomers Market Outlook

9.3.1.1. Market Size & Forecast

9.3.1.1.1. By Value

9.3.1.2. Market Share & Forecast

9.3.1.2.1. By Type

- 9.3.1.2.2. By Application
- 9.3.2. Saudi Arabia Aerospace & Defence Elastomers Market Outlook
 - 9.3.2.1. Market Size & Forecast
 - 9.3.2.1.1. By Value
 - 9.3.2.2. Market Share & Forecast
 - 9.3.2.2.1. By Type
 - 9.3.2.2.2. By Application
- 9.3.3. UAE Aerospace & Defence Elastomers Market Outlook
 - 9.3.3.1. Market Size & Forecast
 - 9.3.3.1.1. By Value
 - 9.3.3.2. Market Share & Forecast
 - 9.3.3.2.1. By Type
 - 9.3.3.2.2. By Application
- 9.3.4. Egypt Aerospace & Defence Elastomers Market Outlook
 - 9.3.4.1. Market Size & Forecast
 - 9.3.4.1.1. By Value
 - 9.3.4.2. Market Share & Forecast
 - 9.3.4.2.1. By Type
 - 9.3.4.2.2. By Application

10. MARKET DYNAMICS

- 10.1. Drivers
- 10.2. Challenges

11. MARKET TRENDS & DEVELOPMENTS

- 11.1. Recent Developments
- 11.2. Product Launches
- 11.3. Mergers & Acquisitions

12. GLOBAL AEROSPACE & DEFENCE ELASTOMERS MARKET: SWOT ANALYSIS

13. PORTER'S FIVE FORCES ANALYSIS

- 13.1. Competition in the Industry
- 13.2. Potential of New Entrants
- 13.3. Power of Suppliers

13.4. Power of Customers

13.5. Threat of Substitute Product

14. COMPETITIVE LANDSCAPE

14.1. Saint-Gobain Limited

14.1.1. Business Overview

14.1.2. Company Snapshot

14.1.3. Products & Services

14.1.4. Current Capacity Analysis

14.1.5. Financials (In case of listed)

14.1.6. Recent Developments

14.1.7. SWOT Analysis

14.2. LANXESS AG

14.3. Solvay SA

14.4. Dow Corning Ltd

14.5. Greene Inc

14.6. The Chemours Company

14.7. Wacker Chemie AG

14.8. Trelleborg AB

14.9. Momentive Performance Materials Inc

14.10. 3M Company

15. STRATEGIC RECOMMENDATIONS

16. ABOUT US & DISCLAIMER

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