

## CF Textile in the Aerospace & Defense Market Report: Trends, Forecast and Competitive Analysis to 2031

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### **Abstracts**

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CF Textile in the Aerospace & Defense Trends and Forecast

The future of CF textile in the global aerospace & defense market looks promising with opportunities in the aircraft interior wall, exterior covering, fuselage, and engine cowl markets. CF textile in the global aerospace & defense market is expected to grow with a CAGR of 7.0% from 2025 to 2031. The major drivers for this market are the increasing demand for lightweight and high-strength materials, technological advancements in carbon fiber textile manufacturing, and improvements in carbon fiber textile technology.

Lucintel forecasts that, within the product type category, non-woven textiles are expected to witness higher growth over the forecast period.

Within the application category, aircraft interior walls are expected to witness the highest growth.

In terms of regions, APAC is expected to witness the highest growth over the forecast period.

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Emerging Trends of CF Textile in the Aerospace & Defense Market



New trends are emerging in the CF textile in aerospace and defense, which facilitate the uptake of carbon fiber textiles due to their performance, sustainability, manufacturability, and other advantages. For industry stakeholders, it is imperative to comprehend these trends to maximize opportunities in the changing terrain.

Strengthening Demand for Advanced Lightweight Materials: The aerospace industry has shifted its emphasis to the international weight of vehicles to increase fuel efficiency and operational performance. For this reason, the use of CF textiles has become common in both civil and defense aircraft designs. It is also noted that other advanced materials, like carbon fiber, are becoming more ubiquitous as economic targets for aircraft manufacturing become more ambitious.

Green Procurement and Recycling Programs: As the industry reflects, customer awareness of the additional costs associated with environmental consequences is increasing. Most of such waste, and more recent CF textiles, are made available from crops with superlative recyclability characteristics. Many manufacturers are investing in processes that will allow them to retrieve carbon fibers from old planes for production use in aerospace industries, in line with manufacturers' sustainable efforts.

Technology Innovations in Manufacturing Processes: New developments in processes, such as automated fiber placement and additive manufacturing systems, have enhanced the production of CF textiles. These developments promote a reduction in lead time and less waste in designs, enabling manufacturers to mass-produce components with precise machining tolerances for aircraft that meet engineering requirements while being economically reasonable.

Rising Utilization of CF Textiles in the Defense Sector: The defense industry has witnessed a growing trend in the application of CF textiles for military purposes. From RPAS to tankers, additional capabilities include boundary layer control, weight saving, and performance improvement thanks to carbon fiber composites in basic construction. CF textiles have become essential components of numerous advanced military developments as armed forces pursue new materials and technologies for further optimization of their fighting capabilities.

Working with Other Countries and Transfer of Technology: The collaboration between the aerospace industry and research institutes around the world has



become a significant stimulus for CF textile application development. Working in groups provides access to know-how, technologies, and effective workflows that countries use in the production and usage of carbon fibers. This is common in countries seeking to expand their aerospace industry base through partnerships.

These trends are influencing the development of the CF textile market for aerospace and defense sectors by shifting the focus to weight reduction, environmentally friendly designs, and sophisticated technologies. Carbon fiber is gradually becoming the solution to the needs of modern aviation and defense systems as the market shifts toward these trends.

Recent Developments in CF Textile in the Aerospace & Defense Market

CF textile in the aerospace and defense market is presently undergoing rapid growth and changes that show its trends, and future applications usage is on the increase. As technology and strategic plans progress, the use of carbon fiber for performance and sustainability in this industry continues to gain momentum.

Integration of Advanced Composites: The interlinks of CF textiles with other composite materials in the construction of aerospace components are on the rise. Structures that involve the use of carbon fiber together with aramid and glass fibers are becoming more popular. This enables the manufacturers to tailor the strength, weight, and environmental resistance of the products helping various industries within the aerospace sector.

Growth of Production Capabilities: The major companies engaged in Aerospace activities are increasing the production capacity of their CF textiles facilities because of demand. Expansion of existing facilities and establishment of new manufacturing plants such as in the U.S. and China is to increase capacity and shorten lead time. This development supports companies in increasing production and rate of innovations, which in turn, drives the developments in the aerospace market.

Research and Development Initiatives: One of the priority areas that stakeholders in the CF textile market focus on is Investment in R&D. Strong cooperative research between the universities, government, and industries is improving the usage of carbon fiber. Such initiatives are also looking at novel manufacturing methods, properties of materials, and application areas thus



helping advance the industry.

Military Modernization Programs: Numerous countries are in the process of renewing their military vehicles. This trend creates a market for advanced materials such as CF textiles. It is most pronounced in the U.S. and its European counterparts where carbon fiber is being put into the manufacture of next-generation fighter planes and unmanned aerial systems. The concern to improve the effectiveness and efficiency of occupational activities makes it necessary to introduce more advanced materials.

Regulatory Support for Innovation: Policies and legal environments are also becoming more favorable toward the application of CF textiles in the aerospace and defense industries. Policies that advocate the sourcing of 'green' materials to minimize the carbon footprint are calling the attention of the practitioners toward the use of advanced materials. Such a legal environment encourages initiation and funding of carbon fiber technology therefore creating an avenue for widely leveraging the same.

These developments are also changing the CF textile market in aerospace and defense enabling new strides in materials and techniques of production. The sector is dynamic as, carbon fiber is progressively becoming the core of meeting the requirements of the modern-day aviation and defense systems.

Strategic Growth Opportunities for CF Textile in the Aerospace & Defense Market

There are many strategic areas of growth in CF textile in the aerospace and defense markets. If these opportunities are examined and found of benefit, the stakeholders will not only increase their market presence but also promote improvements in the industry.

Lightweight Aircraft Components: The manufactured lightweight aircraft components market presents an attractive growth area for CF textiles. As weight reduction is essential for enhanced fuel consumption and better performance, it has been established that carbon fiber is very efficient in this regard. This trend is forecasted to increase the market utilization of CF textiles in fuselages, wings, and other structural components of the airframe and thus the market.

Better Military Usage: From the demands of the defense sector about advanced materials, there is room for CF textiles in military applications. As countries



focus on updating their military fleets, there is an increased incorporation of carbon fibers in fighter jets, drones, and armored vehicles. This is consistent with the emphasis on the more active materials that are desirable to add toughness and efficiency to defense systems.

New Developments in Civil Aviation: With the expansion of the civil aviation industry, CF textiles also have a place in the structure of commercial aircraft. Carbon fiber materials have been demonstrated as critical in helping achieve these goals as airline companies seek to conserve fuel and the environment. This move toward sustainable principles of aviation will also increase the need for CF textiles.

Information Transfer and Satellites in Deep Space: CF textiles are being used by the satellite and their spacecraft industry as this industry advances. Small weight and high strength are inherent in carbon fiber thus making the application appropriate for cost savings in the launch phase without compromising on aspects of structural stability in an outer space environment. This particular market presents an opportunity for significant growth as the exploration of outer space becomes more pronounced.

Reducing Waste and Conserving Resources: Many opportunities open up for CF textiles in the recycling drives because of the increasing focus on sustainability. Carrying out the processes of removing and recycling carbon fibers from decommissioned airplanes ought to improve the circularity of materials in the aerospace industry. In addition to meeting consumers' demand for green materials, businesses that embark on environment-friendly initiatives stand to benefit from competitiveness and compliance with laws.

These strategic growth opportunities are turning the CF textile in the aerospace and defense market upside down. With the target on lightweight parts, military modernization, and green cover, surrounding elements will be able to tap into the growth in demand for high-performance materials in this volatile sector.

CF Textile in the Aerospace & Defense Market Driver and Challenges

There are several drivers and challenges within the CF textile market in aerospace and defense, including technological development, economic factors, and the regulatory environment, among others. It is critical to address these dimensions of the



stakeholders operating in this space.

The factors responsible for driving CF textile in the aerospace and defense market include:

Technological Advancements: The uptake of CF textiles is driven by advancements in material science and manufacturing technology. Other innovations, such as the automation of the production process and improved composition, are making it easier for manufacturers to produce effective components. These technological advancements enhance the attractiveness of carbon fiber in the aerospace and defense sectors.

Lightweight Solution Desired (Reasons for Weight Reduction): Increasing fuel efficiency and improving operational performance are major concerns in aerospace and defense. CF textiles offer key advantages in fabric weight compared to conventional materials, making them essential for today's aircraft and military systems.

Increase in Defense Spending: Increased defense budgets in several countries are fueling the demand for advanced materials like CF textiles. Countries are investing in modernization programs, which require high-performance materials for military planes and equipment. This trend presents significant market opportunities for carbon fiber manufacturers.

Sustainability Measures as a Top Priority: Sustainable practices are becoming increasingly important in aerospace and defense. The use of recyclable CF textiles aligns with sustainable development goals. Manufacturers who prioritize pollution control and green policies are driving the demand for carbon fiber.

Joint Development on a Global Scale: Industry partnerships are advancing the use of CF textiles in aerospace. Through these collaborations, knowledge transfer and innovation in advanced materials are helping countries improve their aerospace capabilities and competitiveness in the global market.

Challenges in CF textile in aerospace and defense market include:

Cost Factors: The production of CF textiles carries a heavy cost burden, which can limit adoption in certain market segments. Although advances in



manufacturing technologies are gradually reducing production costs, high startup costs remain a barrier for many investors. Addressing these cost concerns is crucial to increasing market potential.

Limited Awareness and Expertise: Market growth may be hampered by the lack of awareness and expertise regarding CF textiles among some stakeholders. Many professionals in the aerospace and defense industry are not fully aware of the benefits of carbon fiber and how to apply it effectively. This knowledge gap can be addressed through education and outreach initiatives.

Multi-layered Regulation: The regulatory environment presents challenges for CF textile manufacturers. The varied regulations across regions complicate the process. Improvements in regulatory structures and clearer guidelines are essential for deeper penetration and broader use of carbon fiber technologies in aerospace and defense.

The combination of these drivers and challenges significantly impacts the CF textile market in the aerospace and defense sectors. While technological advancements and a growing focus on sustainability create growth opportunities, barriers such as high costs and low awareness need to be addressed to fully exploit the potential of CF textiles. By understanding these dynamics, key stakeholders in the aerospace and defense sectors can better explore the opportunities related to CF textiles and benefit from their adoption.

List of CF Textile Companies in the Aerospace & Defense Industry

Companies in the market compete on the basis of product quality offered. Major players in this market focus on expanding their manufacturing facilities, R&D investments, infrastructural development, and leverage integration opportunities across the value chain. Through these strategies CF textile companies in the aerospace & defense industry cater increasing demand, ensure competitive effectiveness, develop innovative products & technologies, reduce production costs, and expand their customer base. Some of the CF textile companies in the aerospace & defense industry profiled in this report include-

**Toray Industries** 

**Hexcel Corporation** 



Mitsubishi Chemical Corporation

Syensqo

SGL Carbon Group

**Teijin Limited** 

Formosa Plastics Corporation

DowAksa

Hyosung Corporation

Nippon Graphite Fiber Corporation

CF Textile in the Aerospace & Defense Market by Segment

The study includes a forecast for CF textile in the aerospace & defense market by product type, application, and region.

CF Textile in the Aerospace & Defense Market by Product Type [Analysis by Value from 2019 to 2031]:

Woven Textiles

Non-Woven Textiles

CF Textile in the Aerospace & Defense Market by Application [Analysis by Value from 2019 to 2031]:

Aircraft Interior Wall

**Exterior Covering** 

Fuselage

CF Textile in the Aerospace & Defense Market Report: Trends, Forecast and Competitive Analysis to 2031



Engine Cowls

Others

CF Textile in the Aerospace & Defense Market by Region [Analysis by Value from 2019 to 2031]:

North America

Europe

Asia Pacific

The Rest of the World

Country Wise Outlook for CF Textile in the Aerospace & Defense Market

With a growing emphasis on lightweight and high-performance materials that improve fuel economy and increase durability, the market for carbon fiber (CF) textiles in aerospace and defense remains at the forefront. Owing to countries' focus on technology modernization, the enhancement of operational capabilities, and environmental preservation, the use of CF textiles in aircraft and defense systems is on the rise. It is worth noting that the United States, China, Germany, India, and Japan are all key players in this fast-changing space, with each one of them altering how CF textiles are applied purposefully in the aerospace and defense industries.

United States: Considerable developments in CF textiles are also noted in the USA, especially concerning military aircraft and civil aviation. Leading players in the aerospace industry are undertaking studies for new composite materials that are lightweight but inherently reliable. The use of carbon fiber is increasing in military applications, such as unmanned aerial vehicles and other warfare aircraft, including fighter jets. At the same time, institutions are promoting the use of green materials, which is driving innovations in recycling and minimizing waste in CF textile manufacturing.

China: In a short period, new industries in carbon fiber (CF) production will



enhance the capabilities of China's growing aerospace and defense sectors. As a policy, the state is making significant investments in new establishments to reduce imports. To meet the structural requirements of aircraft and improve fuel efficiency, Chinese aerospace manufacturers are incorporating carbon fiber into airplane structures. Cooperation with foreign companies helps transfer technologies that enable the creation of new composite materials for military applications.

Germany: Germany is the most active country in the use of CF textiles in aerospace, aiming to increase the performance of both civil and military aircraft. German manufacturers are leaders in implementing modern technical processes, such as automated fiber placement, which enhances productivity and uniformity in carbon fiber systems. The incorporation of CF textiles into structural parts, such as airframes and wings, has begun in other parts of the world, and this is self-evident because it helps Germany achieve its objectives of making cleaner and more environmentally friendly planes.

India: With increasing government emphasis on indigenization, India is entering the CF textile market for aerospace and defense applications. The Defense Research and Development Organization (DRDO) is investigating the development of carbon fiber composites for military aircraft and unmanned aerial vehicles (UAVs). Some international aerospace companies are partnering with local firms to transfer knowledge, improving local skills in the production and use of CF textiles in defense systems.

Japan: Japan is making good use of its advancements in materials science to improve the utilization of CF textiles in aerospace and defense. Japanese companies are developing carbon fiber-reinforced plastics for aircraft components, such as wings and fuselages. The culture of innovation in the country has led to significant investment in research and development, especially in the bio-composite field, which integrates carbon fiber with other advanced defense materials for better performance.

Features of CF Textile in the Global Aerospace & Defense Market

Market Size Estimates: CF textile in the aerospace & defense market size estimation in terms of value (\$B).

CF Textile in the Aerospace & Defense Market Report: Trends, Forecast and Competitive Analysis to 2031



Trend and Forecast Analysis: Market trends (2019 to 2024) and forecast (2025 to 2031) by various segments and regions.

Segmentation Analysis: CF textile in the aerospace & defense market size by product type, application, and region in terms of value (\$B).

Regional Analysis: CF textile in the aerospace & defense market breakdown by North America, Europe, Asia Pacific, and Rest of the World.

Growth Opportunities: Analysis of growth opportunities in different product type, application, and regions for the CF textile in the aerospace & defense market.

Strategic Analysis: This includes M&A, new product development, and competitive landscape of the CF textile in the aerospace & defense market.

Analysis of competitive intensity of the industry based on Porter's Five Forces model.

If you are looking to expand your business in this or adjacent markets, then contact us. We have done hundreds of strategic consulting projects in market entry, opportunity screening, due diligence, supply chain analysis, M & A, and more.

This report answers following 11 key questions:

Q.1. What are some of the most promising, high-growth opportunities for CF textile in the aerospace & defense market by product type (woven textiles and non-woven textiles), application (aircraft interior wall, exterior covering, fuselage, engine cowls, and others), and region (North America, Europe, Asia Pacific, and the Rest of the World)?

Q.2. Which segments will grow at a faster pace and why?

Q.3. Which region will grow at a faster pace and why?

Q.4. What are the key factors affecting market dynamics? What are the key challenges and business risks in this market?

Q.5. What are the business risks and competitive threats in this market?

Q.6. What are the emerging trends in this market and the reasons behind them?



Q.7. What are some of the changing demands of customers in the market?

Q.8. What are the new developments in the market? Which companies are leading these developments?

Q.9. Who are the major players in this market? What strategic initiatives are key players pursuing for business growth?

Q.10. What are some of the competing products in this market and how big of a threat do they pose for loss of market share by material or product substitution?

Q.11. What M&A activity has occurred in the last 5 years and what has its impact been on the industry?



### Contents

#### **1. EXECUTIVE SUMMARY**

# 2. CF TEXTILE IN THE GLOBAL AEROSPACE & DEFENSE MARKET : MARKET DYNAMICS

- 2.1: Introduction, Background, and Classifications
- 2.2: Supply Chain
- 2.3: Industry Drivers and Challenges

### 3. MARKET TRENDS AND FORECAST ANALYSIS FROM 2019 TO 2031

3.1. Macroeconomic Trends (2019-2024) and Forecast (2025-2031)

3.2. CF Textile in the Global Aerospace & Defense Market Trends (2019-2024) and Forecast (2025-2031)

- 3.3: CF Textile in the Global Aerospace & Defense Market by Product Type
  - 3.3.1: Woven Textiles
  - 3.3.2: Non-Woven Textiles
- 3.4: CF Textile in the Global Aerospace & Defense Market by Application
  - 3.4.1: Aircraft Interior Wall
  - 3.4.2: Exterior Covering
  - 3.4.3: Fuselage
  - 3.4.4: Engine Cowls
  - 3.4.5: Others

# 4. MARKET TRENDS AND FORECAST ANALYSIS BY REGION FROM 2019 TO 2031

4.1: CF Textile in the Global Aerospace & Defense Market by Region

4.2: CF Textile in the North American Aerospace & Defense Market

4.2.1: North American Market by Product Type: Woven Textiles and Non-Woven Textiles

4.2.2: North American Market by Application: Aircraft Interior Wall, Exterior Covering, Fuselage, Engine Cowls, and Others

4.3: CF Textile in the European Aerospace & Defense Market

4.3.1: European Market by Product Type: Woven Textiles and Non-Woven Textiles

4.3.2: European Market by Application: Aircraft Interior Wall, Exterior Covering, Fuselage, Engine Cowls, and Others



4.4: CF Textile in the APAC Aerospace & Defense Market

4.4.1: APAC Market by Product Type: Woven Textiles and Non-Woven Textiles

4.4.2: APAC Market by Application: Aircraft Interior Wall, Exterior Covering, Fuselage, Engine Cowls, and Others

4.5: CF Textile in the ROW Aerospace & Defense Market

4.5.1: ROW Market by Product Type: Woven Textiles and Non-Woven Textiles

4.5.2: ROW Market by Application: Aircraft Interior Wall, Exterior Covering, Fuselage, Engine Cowls, and Others

### 5. COMPETITOR ANALYSIS

- 5.1: Product Portfolio Analysis
- 5.2: Operational Integration
- 5.3: Porter's Five Forces Analysis

### 6. GROWTH OPPORTUNITIES AND STRATEGIC ANALYSIS

6.1: Growth Opportunity Analysis

6.1.1: Growth Opportunities for CF Textile in the Global Aerospace & Defense Market by Product Type

6.1.2: Growth Opportunities for CF Textile in the Global Aerospace & Defense Market by Application

6.1.3: Growth Opportunities for CF Textile in the Global Aerospace & Defense Market by Region

6.2: Emerging Trends in CF Textile in the Global Aerospace & Defense Market

- 6.3: Strategic Analysis
  - 6.3.1: New Product Development
  - 6.3.2: Capacity Expansion of CF Textile in the Global Aerospace & Defense Market
- 6.3.3: Mergers, Acquisitions, and Joint Ventures in CF Textile in the Global Aerospace
- & Defense Market
- 6.3.4: Certification and Licensing

### 7. COMPANY PROFILES OF LEADING PLAYERS

- 7.1: Toray Industries
- 7.2: Hexcel Corporation
- 7.3: Mitsubishi Chemical Corporation
- 7.4: Syensqo
- 7.5: SGL Carbon Group



- 7.6: Teijin Limited
- 7.7: Formosa Plastics Corporation
- 7.8: DowAksa
- 7.9: Hyosung Corporation
- 7.10: Nippon Graphite Fiber Corporation



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