

Advanced Carbon Composites Market Forecasts to 2034 – Global Analysis By Reinforcement (Carbon Fiber, Carbon Fabric, Carbon Nanotubes, Hybrid Reinforcement and Other Reinforcements), Matrix Material, Manufacturing Process, Application, Industry and Geography

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Abstracts

According to Statistics MRC, the Global Advanced Carbon Composites Market is accounted for \$38.5 billion in 2026 and is expected to reach \$79.5 billion by 2034 growing at a CAGR of 9.5% during the forecast period. Advanced carbon composites are high-performance composite materials that combine carbon fibers, carbon fabrics, or other carbon-based reinforcements with polymer, ceramic, or metal matrices to achieve exceptional mechanical, thermal, and chemical properties. These composites provide high strength-to-weight ratios, outstanding stiffness, fatigue resistance, corrosion resistance, and thermal stability. They are extensively used in aerospace, automotive, renewable energy, defense, sporting goods, and industrial equipment to improve performance while reducing weight. Continuous advancements in manufacturing technologies and material engineering are expanding the capabilities and applications of advanced carbon composites. Growing demand for lightweight, durable, and energy-efficient materials is driving the global adoption of advanced carbon composites.

Market Dynamics:

Driver:

Growing aerospace and automotive adoption

Carbon composites reduce fuel consumption and improve performance, making them essential for modern aircraft and vehicles. Aerospace manufacturers are using composites in fuselage structures, wings, and interiors to enhance efficiency and safety. Automakers are adopting them in body panels, drive shafts, and structural components to meet sustainability goals. Enterprises benefit from reduced emissions and extended product lifespans. As demand for advanced mobility solutions rises, carbon composites are becoming indispensable across these industries.

Restraint:

Complex recycling process challenges

The materials are difficult to break down without losing structural integrity, which complicates reuse. Enterprises face high costs and technical barriers in developing effective recycling methods. Smaller firms often lack the infrastructure to manage waste efficiently. Governments are encouraging research into sustainable recycling, but progress is slow. Vendors are experimenting with chemical and thermal processes to improve recovery rates. Until recycling becomes more feasible, environmental concerns will continue to restrain market growth.

Opportunity:

Development of high-performance composites

Innovations in resin systems, fiber architecture, and hybrid materials are expanding the range of applications. Enterprises benefit from composites that deliver superior strength, durability, and thermal resistance. Aerospace and automotive sectors are particularly interested in next-generation composites that can withstand extreme conditions. Governments are funding research programs to accelerate material innovation. Vendors are collaborating with universities and research institutions to push boundaries. As these advancements mature, they will unlock new possibilities for carbon composites in diverse industries.

Threat:

Carbon fiber supply constraints

Manufacturing carbon fiber is resource-intensive, requiring specialized equipment and

raw materials. Enterprises risk delays and higher costs when supply chains are disrupted. Smaller firms are especially vulnerable to shortages, limiting their ability to compete. Vendors are working to expand production capacity, but demand often outpaces supply. Governments are monitoring supply chain vulnerabilities to ensure stability. Persistent constraints could slow down the adoption of advanced carbon composites globally.

Covid-19 Impact:

The Covid-19 pandemic initially disrupted production and slowed demand in aerospace and automotive sectors. Supply chain interruptions delayed composite projects and reduced investment in new technologies. However, the crisis also highlighted the importance of lightweight materials that improve efficiency and reduce costs. Enterprises began exploring composites to strengthen resilience in critical applications. Governments included advanced materials in recovery strategies, boosting funding for innovation. Overall, Covid-19 acted as a catalyst, accelerating long-term interest in advanced carbon composites.

The carbon fiber segment is expected to be the largest during the forecast period

The carbon fiber segment is expected to account for the largest market share during the forecast period as its exceptional strength-to-weight ratio and versatility. Enterprises benefit from its application in aerospace, automotive, and industrial sectors. Vendors are investing in scalable production methods to meet rising demand. Governments are supporting research into carbon fiber for sustainable manufacturing. Academic institutions continue to publish breakthroughs in fiber properties and applications. This segment is anchoring overall market revenue growth.

The wind turbine blades segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the wind turbine blades segment is predicted to witness the highest growth rate due to rising demand for renewable energy is fueling interest in carbon composite blades that improve efficiency and durability. Enterprises benefit from longer lifespans and reduced maintenance costs for turbines. Governments are funding renewable energy programs that encourage adoption of advanced composites. Vendors are developing innovative blade designs tailored for offshore and onshore applications. Awareness campaigns highlight the role of composites in advancing clean energy.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share owing to the region benefits from advanced manufacturing infrastructure and strong investment capacity. Early adoption of carbon composites has positioned the US and Canada as leaders in aerospace and automotive innovation. Enterprises are increasingly deploying composites in defense, automotive, and renewable energy sectors. Policy frameworks encourage modernization and sustainability across industries. Academic institutions are actively researching composite applications.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR driven by rapid industrialization and growing demand for lightweight materials are key drivers. Countries such as China, Japan, India, and South Korea are investing heavily in composite research and commercialization. Affordable solutions are gaining traction among mid-sized enterprises, expanding market reach. Governments are supporting innovation through subsidies and regulatory reforms. Younger demographics are increasingly drawn to careers in advanced materials research.

Key players in the market

Some of the key players in Advanced Carbon Composites Market include Toray Industries, Inc., Teijin Limited, Hexcel Corporation, SGL Carbon SE, Solvay S.A., Mitsubishi Chemical Group Corporation, Huntsman Corporation, Arkema S.A., Spirit AeroSystems Holdings, Inc., Avient Corporation, Gurit Holding AG, Exel Composites Plc, OWENS CORNING, Kordsa Teknik Tekstil A.?. and Strongwell Corporation.

Key Developments:

In April 2026, Toray Composite Materials America, Inc. entered a comprehensive five-year carbon fiber supply agreement with Syensqo SA. The strategic framework focuses on stabilizing production security and supply chain resilience for high-modulus preregs utilized across long-range commercial aircraft and defense aerospace programs.

In November 2025, Teijin Limited introduced an ultra-lightweight carbon fiber thermoplastic unidirectional tape (UD tape) engineered for rapid automated fiber placement (AFP) in commercial aerospace fuselages. The engineering launch achieves high fracture toughness and impact resistance while enabling rapid thermoforming

cycles that completely bypass conventional autoclave processing bottlenecks.

Reinforcements Covered:

Carbon Fiber

Carbon Fabric

Carbon Nanotubes

Hybrid Reinforcement

Other Reinforcements

Matrix Materials Covered:

Thermoset

Thermoplastic

Ceramic Matrix

Carbon Matrix

Other Matrix Materials

Manufacturing Processes Covered:

Filament Winding

Resin Transfer Molding

Compression Molding

Autoclave Molding

Other Manufacturing Processes

Applications Covered:

Aircraft Structures

Automotive Components

Wind Turbine Blades

Sporting Goods

Other Applications

Industries Covered:

Aerospace

Automotive

Energy

Marine

Other Industries

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

Africa

South Africa

Egypt

Morocco

Rest of Africa

What our report offers:

Market share assessments for the regional and country-level segments

Strategic recommendations for the new entrants

Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)

Strategic recommendations in key business segments based on the market estimations

Competitive landscaping mapping the key common trends

Company profiling with detailed strategies, financials, and recent developments

Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

Contents

1 EXECUTIVE SUMMARY

- 1.1 Market Snapshot and Key Highlights
- 1.2 Growth Drivers, Challenges, and Opportunities
- 1.3 Competitive Landscape Overview
- 1.4 Strategic Insights and Recommendations

2 RESEARCH FRAMEWORK

- 2.1 Study Objectives and Scope
- 2.2 Stakeholder Analysis
- 2.3 Research Assumptions and Limitations
- 2.4 Research Methodology
 - 2.4.1 Data Collection (Primary and Secondary)
 - 2.4.2 Data Modeling and Estimation Techniques
 - 2.4.3 Data Validation and Triangulation
 - 2.4.4 Analytical and Forecasting Approach

3 MARKET DYNAMICS AND TREND ANALYSIS

- 3.1 Market Definition and Structure
- 3.2 Key Market Drivers
- 3.3 Market Restraints and Challenges
- 3.4 Growth Opportunities and Investment Hotspots
- 3.5 Industry Threats and Risk Assessment
- 3.6 Technology and Innovation Landscape
- 3.7 Emerging and High-Growth Markets
- 3.8 Regulatory and Policy Environment
- 3.9 Impact of COVID-19 and Recovery Outlook

4 COMPETITIVE AND STRATEGIC ASSESSMENT

- 4.1 Porter's Five Forces Analysis
 - 4.1.1 Supplier Bargaining Power
 - 4.1.2 Buyer Bargaining Power
 - 4.1.3 Threat of Substitutes
 - 4.1.4 Threat of New Entrants

- 4.1.5 Competitive Rivalry
- 4.2 Market Share Analysis of Key Players
- 4.3 Product Benchmarking and Performance Comparison

5 GLOBAL ADVANCED CARBON COMPOSITES MARKET, BY REINFORCEMENT

- 5.1 Carbon Fiber
- 5.2 Carbon Fabric
- 5.3 Carbon Nanotubes
- 5.4 Hybrid Reinforcement
- 5.5 Other Reinforcements

6 GLOBAL ADVANCED CARBON COMPOSITES MARKET, BY MATRIX MATERIAL

- 6.1 Thermoset
- 6.2 Thermoplastic
- 6.3 Ceramic Matrix
- 6.4 Carbon Matrix
- 6.5 Other Matrix Materials

7 GLOBAL ADVANCED CARBON COMPOSITES MARKET, BY MANUFACTURING PROCESS

- 7.1 Filament Winding
- 7.2 Resin Transfer Molding
- 7.3 Compression Molding
- 7.4 Autoclave Molding
- 7.5 Other Manufacturing Processes

8 GLOBAL ADVANCED CARBON COMPOSITES MARKET, BY APPLICATION

- 8.1 Aircraft Structures
- 8.2 Automotive Components
- 8.3 Wind Turbine Blades
- 8.4 Sporting Goods
- 8.5 Other Applications

9 GLOBAL ADVANCED CARBON COMPOSITES MARKET, BY INDUSTRY

- 9.1 Aerospace
- 9.2 Automotive
- 9.3 Energy
- 9.4 Marine
- 9.5 Other Industries

10 GLOBAL ADVANCED CARBON COMPOSITES MARKET, BY GEOGRAPHY

- 10.1 North America
 - 10.1.1 United States
 - 10.1.2 Canada
 - 10.1.3 Mexico
- 10.2 Europe
 - 10.2.1 United Kingdom
 - 10.2.2 Germany
 - 10.2.3 France
 - 10.2.4 Italy
 - 10.2.5 Spain
 - 10.2.6 Netherlands
 - 10.2.7 Belgium
 - 10.2.8 Sweden
 - 10.2.9 Switzerland
 - 10.2.10 Poland
 - 10.2.11 Rest of Europe
- 10.3 Asia Pacific
 - 10.3.1 China
 - 10.3.2 Japan
 - 10.3.3 India
 - 10.3.4 South Korea
 - 10.3.5 Australia
 - 10.3.6 Indonesia
 - 10.3.7 Thailand
 - 10.3.8 Malaysia
 - 10.3.9 Singapore
 - 10.3.10 Vietnam
 - 10.3.11 Rest of Asia Pacific
- 10.4 South America
 - 10.4.1 Brazil
 - 10.4.2 Argentina

- 10.4.3 Colombia
- 10.4.4 Chile
- 10.4.5 Peru
- 10.4.6 Rest of South America
- 10.5 Rest of the World (RoW)
 - 10.5.1 Middle East
 - 10.5.1.1 Saudi Arabia
 - 10.5.1.2 United Arab Emirates
 - 10.5.1.3 Qatar
 - 10.5.1.4 Israel
 - 10.5.1.5 Rest of Middle East
 - 10.5.2 Africa
 - 10.5.2.1 South Africa
 - 10.5.2.2 Egypt
 - 10.5.2.3 Morocco
 - 10.5.2.4 Rest of Africa

11 STRATEGIC MARKET INTELLIGENCE

- 11.1 Industry Value Network and Supply Chain Assessment
- 11.2 White-Space and Opportunity Mapping
- 11.3 Product Evolution and Market Life Cycle Analysis
- 11.4 Channel, Distributor, and Go-to-Market Assessment

12 INDUSTRY DEVELOPMENTS AND STRATEGIC INITIATIVES

- 12.1 Mergers and Acquisitions
- 12.2 Partnerships, Alliances, and Joint Ventures
- 12.3 New Product Launches and Certifications
- 12.4 Capacity Expansion and Investments
- 12.5 Other Strategic Initiatives

13 COMPANY PROFILES

- 13.1 Toray Industries, Inc.
- 13.2 Teijin Limited
- 13.3 Hexcel Corporation
- 13.4 SGL Carbon SE
- 13.5 Solvay S.A.

- 13.6 Mitsubishi Chemical Group Corporation
- 13.7 Huntsman Corporation
- 13.8 Arkema S.A.
- 13.9 Spirit AeroSystems Holdings, Inc.
- 13.10 Avient Corporation
- 13.11 Gurit Holding AG
- 13.12 Exel Composites Plc
- 13.13 OWENS CORNING
- 13.14 Kordsa Teknik Tekstil A.?
- 13.15 Strongwell Corporation

List Of Tables

LIST OF TABLES

Table 1 Global Advanced Carbon Composites Market Outlook, By Region (2023-2034) (\$MN)

Table 2 Global Advanced Carbon Composites Market, By Reinforcement (2023–2034) (\$MN)

Table 3 Global Advanced Carbon Composites Market, By Carbon Fiber (2023–2034) (\$MN)

Table 4 Global Advanced Carbon Composites Market, By Carbon Fabric (2023–2034) (\$MN)

Table 5 Global Advanced Carbon Composites Market, By Carbon Nanotubes (2023–2034) (\$MN)

Table 6 Global Advanced Carbon Composites Market, By Hybrid Reinforcement (2023–2034) (\$MN)

Table 7 Global Advanced Carbon Composites Market, By Other Reinforcements (2023–2034) (\$MN)

Table 8 Global Advanced Carbon Composites Market, By Matrix Material (2023–2034) (\$MN)

Table 9 Global Advanced Carbon Composites Market, By Thermoset (2023–2034) (\$MN)

Table 10 Global Advanced Carbon Composites Market, By Thermoplastic (2023–2034) (\$MN)

Table 11 Global Advanced Carbon Composites Market, By Ceramic Matrix (2023–2034) (\$MN)

Table 12 Global Advanced Carbon Composites Market, By Carbon Matrix (2023–2034) (\$MN)

Table 13 Global Advanced Carbon Composites Market, By Other Matrix Materials (2023–2034) (\$MN)

Table 14 Global Advanced Carbon Composites Market, By Manufacturing Process (2023–2034) (\$MN)

Table 15 Global Advanced Carbon Composites Market, By Filament Winding (2023–2034) (\$MN)

Table 16 Global Advanced Carbon Composites Market, By Resin Transfer Molding (2023–2034) (\$MN)

Table 17 Global Advanced Carbon Composites Market, By Compression Molding (2023–2034) (\$MN)

Table 18 Global Advanced Carbon Composites Market, By Autoclave Molding

(2023–2034) (\$MN)

Table 19 Global Advanced Carbon Composites Market, By Other Manufacturing Processes (2023–2034) (\$MN)

Table 20 Global Advanced Carbon Composites Market, By Application (2023–2034) (\$MN)

Table 21 Global Advanced Carbon Composites Market, By Aircraft Structures (2023–2034) (\$MN)

Table 22 Global Advanced Carbon Composites Market, By Automotive Components (2023–2034) (\$MN)

Table 23 Global Advanced Carbon Composites Market, By Wind Turbine Blades (2023–2034) (\$MN)

Table 24 Global Advanced Carbon Composites Market, By Sporting Goods (2023–2034) (\$MN)

Table 25 Global Advanced Carbon Composites Market, By Other Applications (2023–2034) (\$MN)

Table 26 Global Advanced Carbon Composites Market, By Industry (2023–2034) (\$MN)

Table 27 Global Advanced Carbon Composites Market, By Aerospace (2023–2034) (\$MN)

Table 28 Global Advanced Carbon Composites Market, By Automotive (2023–2034) (\$MN)

Table 29 Global Advanced Carbon Composites Market, By Energy (2023–2034) (\$MN)

Table 30 Global Advanced Carbon Composites Market, By Marine (2023–2034) (\$MN)

Table 31 Global Advanced Carbon Composites Market, By Other Industries (2023–2034) (\$MN)

Note: Tables for North America, Europe, APAC, South America, and Rest of the World (RoW) are also represented in the same manner as above.

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