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Carbon Fiber Prepreg Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Manufacturing Process (Solvent Dip and Hot Melt), By Resin Type (Epoxy, Phenolic, Thermoplastic, and Others), By End Use Industry (Aerospace & Defense, Wind Energy, and Others), By Region and Competition, 2020-2030F

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Abstracts

Market Overview

Global Carbon Fiber Prepreg Market was valued at USD 7.61 Billion in 2024 and is expected to reach USD 9.73 Billion by 2030 with a CAGR of 4.15% during the forecast period. The global carbon fiber prepreg market is witnessing robust growth, driven by increasing demand for lightweight and high-performance materials across a range of industries including aerospace, automotive, wind energy, sports and recreation, and defense. Carbon fiber prepreg—a pre-impregnated composite material consisting of carbon fibers reinforced with a resin matrix—offers superior mechanical strength, excellent fatigue resistance, and reduced weight, making it a preferred material for advanced engineering applications. The United Kingdom, United States, and Italy are top exporters of carbon fiber prepreg worldwide.

The aerospace sector continues to be the largest consumer of carbon fiber prepregs, driven by the need for fuel-efficient aircraft. The material’s ability to reduce overall aircraft weight without compromising safety or performance has resulted in widespread adoption in both commercial and military aviation. In the automotive industry, the drive toward electric vehicles (EVs) and fuel efficiency standards has created strong demand for lightweight materials. Carbon fiber prepregs help improve vehicle range and reduce

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emissions by significantly lowering vehicle weight. With the global push toward renewable energy, wind turbine blade manufacturing is increasingly relying on carbon fiber prepregs due to their durability and high strength-to-weight ratio. This trend is particularly strong in Europe and China. . In 2021, wind electricity generation was increased by 17% (273?TWh) which was 55% higher growth than that attained in 2020 and plan to reach almost 8000 TWh in 2030. As an outcome, wind energy experienced the highest growth among all renewable power technologies such as solar, biomass, etc.The sports and recreation sector is also contributing to market growth. From tennis rackets and bicycles to golf clubs and snowboards, carbon fiber prepregs are extensively used to enhance product performance.

Key Market Drivers

Rising Demand from the Aerospace and Defense Sector

The global carbon fiber prepreg market is witnessing substantial growth, largely driven by escalating demand from the aerospace and defense sectors. Carbon fiber prepregs — pre-impregnated composite fibers with a resin system — offer exceptional strength-to-weight ratio, stiffness, and durability. These materials are increasingly favored in aerospace and defense applications, where weight reduction, fuel efficiency, and structural integrity are critical performance parameters.

In the aerospace industry, the shift towards lighter, more fuel-efficient aircraft has significantly propelled the use of carbon fiber prepregs. Leading aircraft manufacturers such as Boeing and Airbus are incorporating these materials into major structural components including fuselages, wings, and tail sections. The Boeing 787 Dreamliner, for instance, uses over 50% composite materials by weight, primarily carbon fiber prepregs. This trend is expected to continue as the industry focuses on lowering emissions and improving operational efficiency in line with global sustainability goals.

The defense sector also represents a key growth avenue for carbon fiber prepreg manufacturers. Military aircraft, drones, and missile systems increasingly require materials that offer superior mechanical performance and radar-absorbing properties. Carbon fiber prepregs enable the production of lighter, stealthier, and more agile defense equipment. In addition, countries around the world are expanding their defense budgets, thereby driving the demand for advanced composites used in next-generation military platforms.

Technological advancements in prepreg manufacturing processes and resin systems

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have further enhanced their appeal. Improvements in out-of-autoclave curing and automation have reduced production costs and cycle times, making carbon fiber prepregs more accessible to a broader range of aerospace and defense applications. Additionally, the development of thermoplastic prepregs, which offer recyclability and impact resistance, is gaining traction and opening up new opportunities for material innovation.

The rising demand from the aerospace and defense sector is a primary driver of the global carbon fiber prepreg market. With industry trends favoring lightweight, high-performance materials, and governments prioritizing modernization of defense infrastructure, the market is poised for robust expansion in the coming years. Stakeholders across the value chain — from raw material suppliers to component manufacturers — are expected to benefit from this upward trajectory.

Key Market Challenges

High Cost Of Carbon Fiber Prepregs

The global carbon fiber prepreg market, while experiencing significant growth across aerospace, automotive, wind energy, and sports sectors, faces several market challenges that hinder its full potential. One of the primary barriers is the high cost of carbon fiber prepregs, driven by expensive raw materials and complex manufacturing processes. The production of carbon fibers from precursors such as polyacrylonitrile (PAN) is energy-intensive and capital-heavy, resulting in higher final product costs. These costs are further compounded by the requirement for precision handling, temperature control, and specialized storage conditions, particularly for thermoset prepregs.

Key Market Trends

Bolstering Wind Energy Sector is Propelling Factor for Carbon Fiber Prepreg Market

Wind turbine blades need to be lightweight yet strong to withstand the dynamic loads imposed by wind and other environmental conditions. Carbon fiber prepregs offer an excellent strength-to-weight ratio, making them ideal for manufacturing longer and more efficient wind turbine blades. The lightweight nature of carbon fiber prepregs reduces the overall weight of the blades, enabling higher energy output and improved performance. The global wind energy capacity has been expanding rapidly as countries aim to increase their renewable energy generation. Wind turbines are being installed in

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onshore and offshore locations, driving the demand for carbon fiber prepregs used in wind turbine blade production. As the wind energy sector continues to grow, there is a corresponding increase in the requirement for carbon fiber prepregs to support this expansion. In 2021, wind electricity generation was increased by 17% (273?TWh) which was 55% higher growth than that attained in 2020 and plan to reach almost 8000 TWh in 2030. As an outcome, wind energy experienced the highest growth among all renewable power technologies such as solar, biomass, etc.

Carbon fiber prepregs contribute to the improved efficiency of wind turbines. By using carbon fiber prepregs in blade manufacturing, turbine manufacturers can design longer and more aerodynamic blades. Longer blades capture more wind energy, resulting in higher energy generation. As wind energy projects aim to maximize energy output and minimize costs, carbon fiber prepregs become crucial in achieving these objectives.

Wind turbine blades are subject to continuous cyclic loading and harsh environmental conditions, including wind, rain, and temperature variations. Carbon fiber prepregs offer excellent durability and fatigue resistance, ensuring the longevity and reliability of wind turbine blades. The utilization of carbon fiber prepregs helps extend the lifespan of blades, reducing maintenance and replacement costs.

Advancements in wind turbine technology, such as larger rotor diameters and higher hub heights, have led to increased requirements for longer and stronger blades. Carbon fiber prepregs provide the necessary strength and lightweight characteristics to meet these demands. Ongoing research and development in wind energy technology drive innovations in carbon fiber materials and manufacturing processes, further propelling the growth of the carbon fiber prepreg market.

Governments worldwide are implementing supportive policies and setting renewable energy targets to reduce carbon emissions and combat climate change. These initiatives promote the expansion of wind energy capacity, creating a favorable market environment for carbon fiber prepregs. The demand for clean and sustainable energy sources drives investments in wind energy projects, thereby increasing the requirement for carbon fiber prepregs.

Key Market Players

Mitsubishi Rayon Co. Ltd.

Solvay SA

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Teijin Limited

BASF SE

Toray Industries Inc.

Hexcel Corporation

Gurit Holding Ag

SGL Carbon SE

Park Electrochemical Corporation

Axiom Materials, Inc.

Report Scope

In this report, global carbon fiber prepreg market has been segmented into the following categories, in addition to the industry trends, which have also been detailed below:

Carbon Fiber Prepreg Market, By Manufacturing Process:

Solvent Dip

Hot Melt

Carbon Fiber Prepreg Market, By Resin Type:

Epoxy

Phenolic

Thermoplastic

Others

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Carbon Fiber Prepreg Market, By End Use Industry:

- Aerospace & Defence
- Wind Energy
- Others

Carbon Fiber Prepreg Market, By Region:

- North America
  - United States
  - Mexico
  - Canada
- Europe
  - Germany
  - Spain
  - United Kingdom
  - France
  - Italy
  - Russia
- Asia-Pacific
  - China
  - India
  - Japan

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South Korea

Australia

South America

Brazil

Colombia

Argentina

Middle East & Africa

South Africa

Saudi Arabia

UAE

Competitive landscape

Company Profiles: Detailed analysis of the major companies present in the global carbon fiber prepreg market.

Available Customizations:

With the given market data, TechSci 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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