Carbon Fibre Tape Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Form (Prepreg Tapes and Dry Tapes), By End User (Aerospace & Defense, Automotive, Sports & Leisure, Other), By Region and Competition, 2019-2029F

Market Report | 2024-06-03 | 186 pages | TechSci Research

AVAILABLE LICENSES:

- Single User License $4900.00
- Multi-User License $5900.00
- Custom Research License $8900.00

Report description:

Global Carbon Fibre Tape Market was valued at USD 2.60 Billion in 2023 and is anticipated to project steady growth in the forecast period with a CAGR of 10.15% through 2029. The global carbon fibre tape market has been experiencing robust growth driven by increasing demand from key end-use sectors such as aerospace, automotive, wind energy, sports and leisure, construction, and others. Several factors contribute to the growth of the global carbon fibre tape market. These include the increasing demand for lightweight materials to improve fuel efficiency and performance in industries such as aerospace and automotive. The shift towards renewable energy sources like wind power drives demand for carbon fibre tapes in wind turbine blade manufacturing. Technological advancements, such as automated fibre placement (AFP) and resin transfer molding (RTM), enable more efficient production processes and expand the application scope of carbon fibre tapes. Stringent environmental regulations promoting sustainable practices further propel market growth by encouraging the adoption of eco-friendly materials like carbon fibre composites.

Key Market Drivers

Increasing Demand from Aerospace Industry

The aerospace industry is continuously striving to reduce the weight of aircraft to improve fuel efficiency and enhance performance. Carbon fibre tapes offer an excellent strength-to-weight ratio, making them ideal for lightweight structural applications. As a result, aircraft manufacturers are increasingly incorporating carbon fibre tapes into the design and production of various components such as fuselages, wings, empennages, and interior structures. Carbon fibre tapes provide exceptional mechanical properties, including high tensile strength, stiffness, and fatigue resistance. These properties are crucial for ensuring the structural integrity and safety of aircraft components, especially in demanding aerospace environments. The superior

performance characteristics of carbon fibre tapes make them indispensable for applications where reliability and durability are paramount.

With the aviation industry facing pressure to reduce fuel consumption and emissions, there is a growing emphasis on lightweight materials like carbon fibre tapes. By replacing traditional metallic components with carbon fibre -reinforced composites, aircraft manufacturers can achieve significant weight savings, resulting in lower fuel consumption and reduced environmental impact. This aligns with global initiatives to mitigate climate change and promote sustainability in aviation. Advancements in manufacturing technologies, such as automated tape laying (ATL) and automated fibre placement (AFP), have made it possible to produce complex shapes and structures using carbon fibre tapes efficiently. These automated processes offer higher precision, repeatability, and cost-effectiveness compared to traditional manufacturing methods, thereby facilitating the widespread adoption of carbon fibre tapes in aerospace applications.

The rapid expansion of the commercial aviation market, driven by factors such as increasing air travel demand, rising disposable incomes, and the emergence of low-cost carriers, is driving the demand for lightweight materials like carbon fibre tapes. As aircraft production rates continue to rise to meet this growing demand, the demand for carbon fibre tapes as a key structural material is expected to escalate correspondingly. The development and introduction of next-generation aircraft, such as the Boeing 787 Dreamliner and Airbus A350 XWB, which extensively utilize carbon fibre composites including tapes in their airframes, are further fueling the demand for carbon fibre tapes in the aerospace industry. These advanced aircraft platforms leverage the benefits of carbon fibre composites to achieve unprecedented levels of fuel efficiency, performance, and passenger comfort.

The increasing demand from the aerospace industry is a crucial driver for the growth of the global carbon fibre tape market, driven by the industry's need for lightweight, high-performance materials to enhance aircraft efficiency, safety, and environmental sustainability. This demand is expected to continue growing as aerospace manufacturers continue to innovate and develop new generations of aircraft with increasingly demanding performance requirements.

Growing Automotive Sector

The automotive industry is undergoing a paradigm shift towards lightweight materials to enhance fuel efficiency, improve performance, and meet stringent emission regulations. Carbon fibre tapes, renowned for their exceptional strength-to-weight ratio, are increasingly favored by automotive manufacturers to replace traditional materials like steel and aluminum in vehicle components. This shift towards lightweighting drives the demand for carbon fibre tapes in automotive applications. Carbon fibre tapes offer superior mechanical properties such as high tensile strength, stiffness, and impact resistance. When used in automotive components such as body panels, chassis structures, and interior trims, carbon fibre tapes contribute to improved vehicle performance, handling, and safety. As automotive enthusiasts and manufacturers alike seek higher performance standards, the demand for carbon fibre tapes continues to rise.

The growing adoption of electric vehicles (EVs) further amplifies the demand for carbon fibre tapes in the automotive sector. EV manufacturers prioritize lightweight materials to extend driving range and maximize battery efficiency. Carbon fibre tapes play a crucial role in reducing the overall weight of EVs without compromising structural integrity, making them indispensable in the production of electric cars, trucks, and buses. The luxury and performance vehicle segments exhibit a strong inclination towards carbon fibre components due to their premium aesthetics and enhanced performance attributes. Carbon fibre tapes are extensively utilized in high-end vehicles for applications such as aerodynamic body kits, spoilers, and interior accents. As consumer preferences continue to gravitate towards luxury and performance vehicles, the demand for carbon fibre tapes in this segment experiences steady growth.

Advancements in manufacturing technologies, including automated fibre placement (AFP) and resin transfer molding (RTM), have streamlined the production processes for carbon fibre tapes. These technologies enable precise, cost-effective manufacturing of complex shapes and structures, thereby expanding the applicability of carbon fibre tapes in automotive applications. Automotive manufacturers leverage these advanced manufacturing techniques to integrate carbon fibre tapes seamlessly into their production processes. Stringent government regulations aimed at reducing carbon emissions drive automotive manufacturers to explore lightweight materials like carbon fibre tapes. By adopting carbon fibre -reinforced composites, automakers can develop vehicles with reduced environmental footprint and improved fuel economy, thereby complying with emission standards while meeting consumer demand for eco-friendly transportation solutions.

The growing automotive sector serves as a significant catalyst for the growth of the global carbon fibre tape market. The

industry's pursuit of lightweighting, performance enhancement, EV adoption, luxury vehicle production, technological advancements, and regulatory compliance collectively fuel the demand for carbon fibre tapes in automotive applications. As automotive manufacturers continue to prioritize innovation and sustainability, the market for carbon fibre tapes is poised for sustained growth and expansion in the automotive sector.

Advancements in Manufacturing Technologies

AFP and ATL technologies automate the process of laying down carbon fibre tapes or prepreg material onto molds or substrates with high precision and repeatability. These automated systems offer advantages such as reduced labor costs, improved process control, and increased productivity compared to manual layup methods. By leveraging AFP and ATL technologies, manufacturers can produce complex-shaped components with minimal material waste, thereby enhancing the cost-effectiveness and scalability of carbon fibre tape production. RTM and vacuum infusion processes enable the infusion of resin into dry carbon fibre tapes or preforms under controlled conditions. These processes ensure uniform resin distribution, void-free laminate consolidation, and excellent surface finish, resulting in high-quality composite parts with enhanced mechanical properties. RTM and vacuum infusion techniques facilitate the production of lightweight, structurally efficient components for various industries, driving the demand for carbon fibre tapes as reinforcement materials. Additive manufacturing, or 3D printing, offers new possibilities for producing complex geometries and customized parts using carbon fibre -reinforced polymers. By selectively depositing layers of carbon fibre -infused thermoplastic or thermoset materials, additive manufacturing allows for the rapid prototyping and production of lightweight, high-strength components without the need for traditional molds or tooling. The versatility and design freedom offered by additive manufacturing technologies open up innovative applications for carbon fibre tapes in industries such as aerospace, automotive, and medical.

Continuous fibre manufacturing processes involve the direct deposition of continuous carbon fibre onto a substrate followed by resin infusion or consolidation. CFM technologies eliminate the need for pre-impregnated (prepreg) tapes or fabrics, enabling the production of near-net-shape parts with tailored fibre architectures and enhanced mechanical properties. By offering greater flexibility in material selection, fibre orientation, and part geometry, CFM processes broaden the application scope of carbon fibre tapes in industries requiring customized, high-performance components. Advances in nanotechnology enable the development of functionalized carbon fibre with tailored surface properties, improved interfacial adhesion, and enhanced compatibility with matrix materials. Functionalized carbon fibre exhibit superior mechanical, thermal, and electrical properties compared to conventional fibre, opening up new opportunities for their use in advanced composite applications. By incorporating functionalized carbon fibre into tape formulations, manufacturers can create composite materials with enhanced performance characteristics, driving the demand for carbon fibre tapes in specialized applications such as aerospace, defense, and electronics.

Advancements in manufacturing technologies such as automated fibre placement, resin transfer molding, additive manufacturing, continuous fibre manufacturing, and functionalized fibre are instrumental in driving the growth of the global carbon fibre tape market. These technologies enable more efficient production processes, improved product quality, and expanded application possibilities, thereby enhancing the competitiveness and market penetration of carbon fibre tapes across diverse industries. As manufacturing techniques continue to evolve and mature, the demand for carbon fibre tapes is expected to grow further, fueling market expansion and innovation in the composites industry.

Key Market Challenges

High Production Costs

The primary challenges hindering the growth of the carbon fibre tape market is the high production costs associated with carbon fibre materials. Carbon fibre production involves complex and energy-intensive processes such as precursor synthesis, carbonization, and fibre spinning. Additionally, the incorporation of advanced manufacturing techniques like automated fibre placement (AFP) and resin transfer molding (RTM) further adds to the production costs. As a result, carbon fibre tapes tend to be more expensive than traditional materials such as steel and aluminum, limiting their adoption in price-sensitive industries like automotive and construction. Manufacturers face pressure to reduce production costs through process optimization, material efficiency improvements, and scale-up initiatives to make carbon fibre tapes more economically viable for a wider range of applications.

Supply Chain Constraints

The significant challenge for the carbon fibre tape market is the inherent complexity and vulnerability of its supply chain. Carbon

fibre production relies on a limited number of precursor materials derived from petroleum-based sources or alternative feedstocks such as PAN (polyacrylonitrile) or pitch. Any disruptions or fluctuations in the supply of these precursor materials can impact carbon fibre production capacity and lead to supply chain bottlenecks. Additionally, the production of carbon fibre involves stringent quality control measures and long lead times, further complicating the supply chain dynamics. Supply chain constraints can result in supply shortages, increased material costs, and production delays, affecting the availability and affordability of carbon fibre tapes for end-users.

Recycling and End-of-Life Management

The sustainability and environmental impact of carbon fibre materials pose significant challenges for the carbon fibre tape market. While carbon fibre composites offer superior mechanical properties and lightweight advantages, their recycling and end-of-life management remain challenging due to the inherent difficulty in separating and recovering carbon fibre from composite matrices. Currently, most carbon fibre waste ends up in landfills or incineration facilities, contributing to environmental concerns and resource depletion. Efforts to develop cost-effective recycling technologies and establish closed-loop recycling systems for carbon fibre composites are underway, but progress remains slow. Addressing the recycling and end-of-life management challenges is essential to enhance the sustainability profile of carbon fibre tapes and alleviate concerns regarding their environmental impact.

Key Market Trends

Emergence of Sustainable and Recyclable Carbon Fibre Materials

In response to escalating concerns regarding environmental sustainability and resource conservation, there is a burgeoning interest in the development of sustainable and recyclable carbon fibre materials within the business landscape. This burgeoning interest is fueled by continuous innovations in recycling technologies and the exploration of alternative precursor materials. These advancements enable the production of carbon fibre that not only possess reduced environmental footprints but also boast improved end-of-life management strategies. Researchers are actively investigating bio-based precursors sourced from renewable reservoirs such as lignin, cellulose, and agricultural residues. By harnessing these natural resources, they aim to craft eco-friendly carbon fibre that circumvent the environmental toll associated with traditional production methods. Significant strides in recycling processes, including pyrolysis, solvolysis, and chemical recycling, are facilitating the efficient recovery and subsequent reuse of carbon fibre from composite waste streams. This evolution towards sustainable and recyclable carbon fibre materials dovetails seamlessly with the escalating demand for environmentally conscientious solutions across diverse industries. As a result, the carbon fibre tape market is poised for substantial growth, driven by the imperative for sustainable practices and the imperative to meet evolving consumer expectations for eco-friendly products.

Segmental Insights

Form Insights

Based on Form, the Prepreg Tapes emerged as the fastest growing segment in the global market for carbon fibre tape in 2023. Prepreg tapes are manufactured by impregnating carbon fibre with a resin matrix, such as epoxy or thermoplastic, before curing them to form a solid composite material. This process ensures consistent resin distribution, fibre alignment, and void-free consolidation, resulting in superior mechanical properties and performance characteristics. Compared to other forms of carbon fibre tapes, prepreg tapes offer higher strength, stiffness, and dimensional stability, making them ideal for demanding applications in aerospace, automotive, and other industries where reliability and performance are paramount. Prepreg tapes are supplied in a semi-cured state with the resin matrix already impregnated into the carbon fibre. This pre-impregnation simplifies handling and processing, as it eliminates the need for manual resin application and impregnation steps. Manufacturers can directly lay down prepreg tapes onto molds or substrates and cure them at elevated temperatures to achieve the desired shape and properties. This streamlined manufacturing process reduces labor costs, minimizes material waste, and improves production efficiency, making prepreg tapes a preferred choice for high-volume production applications.

End User Insights

Based on End User, Automotive emerged as the dominating segment in the Global Carbon fibre Tape Market in 2023. Automobile manufacturers face mounting pressure to boost fuel efficiency and decrease emissions in order to comply with stringent regulations. Carbon fibre tapes, due to their high strength-to-weight ratio, are well-suited for lightening vehicle components like body panels, chassis, and interiors. This contributes to enhanced fuel efficiency and overall performance. With outstanding mechanical properties such as high tensile strength, stiffness, and resistance to fatigue, carbon fibre tapes are particularly

appealing for demanding automotive applications, such as sports cars and racing vehicles, where superior strength and performance are critical. Compared to conventional materials such as metals, carbon fibre tapes offer designers increased flexibility. They can be shaped into intricate forms and seamlessly integrated into vehicle designs, fostering innovative and aerodynamic designs that enhance both aesthetics and functionality.

Regional Insights

Based on region, North America emerged as the dominant region in the Global Carbon fibre Tape Market in 2023, holding the largest market share in terms of value. North America boasts a robust aerospace and defense sector, with major players like Boeing, Lockheed Martin, and Northrop Grumman leading the market. Carbon fibre tapes are extensively used in aircraft structures, rotor blades, unmanned aerial vehicles (UAVs), and military equipment due to their exceptional strength-to-weight ratio and durability. The region's advanced manufacturing capabilities, technological expertise, and significant investments in research and development drive the demand for carbon fibre tapes in aerospace and defense applications, contributing to the dominance of North America in the global market. The automotive industry in North America is characterized by innovation, technological advancements, and a strong focus on performance and sustainability. Carbon fibre tapes are increasingly being used in lightweighting initiatives to improve fuel efficiency, reduce emissions, and enhance vehicle performance. Automakers such as Tesla, Ford, and General Motors are incorporating carbon fibre tapes into vehicle components such as body panels, chassis structures, and interior trims to achieve weight savings without compromising safety or functionality. The region's leadership in automotive innovation and adoption of advanced materials drive the demand for carbon fibre tapes, further strengthening North America's dominance in the global market.

Key Market Players

?□Evonik Industries AG
?□Saudi Basic Industries Corporation
?□Solvay S.A.
?□Hexcel Corporation
?□TenCate Protective Fabrics
?□SGL Carbon SE
?□TEIJIN LIMITED
?□BASF SE
?□Celanese Corporation
?□Victrex plc

Report Scope:

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

?□Carbon Fibre Tape Market, By Form:
o Dry Tapes
o Prepreg Tapes
?□Carbon Fibre Tape Market, By End User:
o Aerospace & Defense
o Automotive
o Sports & Leisure
o Others
?□Carbon Fibre Tape Market, By Region:
o North America
? United States
? Canada
? Mexico
o Europe
? France

? United Kingdom
? Italy
? Germany
? Spain
o Asia Pacific
? China
? India
? Japan
? Australia
? South Korea
o South America
? Brazil
? Argentina
? Colombia
o Middle East & Africa
? South Africa
? Saudi Arabia
? UAE
Competitive Landscape
Company Profiles: Detailed analysis of the major companies present in the Global Carbon Fibre Tape Market.
Available Customizations:
Global Carbon Fibre Tape 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).

Table of Contents:

Carbon Fibre Tape Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Form (Prepreg Tapes and Dry Tapes), By End User (Aerospace & Defense, Automotive, Sports & Leisure, Other), By Region and Competition, 2019-2029F

Market Report | 2024-06-03 | 186 pages | TechSci Research

To place an Order with Scotts International:

- - Print this form
- - Complete the relevant blank fields and sign
- - Send as a scanned email to support@scotts-international.com

ORDER FORM:

Select license	License	Price
	Single User License	$4900.00
	Multi-User License	$5900.00
	Custom Research License	$8900.00
	VAT	
	Total	

*Please circle the relevant license option. For any questions please contact support@scotts-international.com or 0048 603 394 346.

** VAT will be added at 23% for Polish based companies, individuals and EU based companies who are unable to provide a valid EU Vat Numbers.

Email*		Phone*	
First Name*		Last Name*	
Job title*			
Company Name*		EU Vat / Tax ID / NIP number*	
Address*		City*	
Zip Code*		Country*	

Date	2026-03-17
Signature	