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Global PAN-based Carbon Fiber and Fabrics Market Research Report 2026(Status and Outlook)

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Abstracts

The 2025 U.S. tariff policies introduce profound uncertainty into the global economic landscape. This report critically examines the implications of recent tariff adjustments and international strategic countermeasures on PAN-based Carbon Fiber and Fabrics competitive dynamics, regional economic interdependencies, and supply chain reconfigurations.In 2024, global Carbon Fiber and Fabrics production reached 255,765 tons, with an average global market price of around US$ 33.90 per kg. PAN-based carbon fiber and fabrics refer to high-performance reinforcement materials produced from polyacrylonitrile (PAN) precursor fibers through stabilization, carbonization and graphitization processes, and subsequently formed into woven, knitted or multiaxial fabric structures. This material system offers exceptionally high specific strength, stiffness, fatigue resistance and corrosion resistance, enabling lightweight and high-strength composite solutions for aerospace, wind turbines, rail transit, sports equipment and advanced structural components. It represents a fundamental combined material platform in modern composite manufacturing.PAN-based carbon fiber and fabrics constitute a unified high-performance material system produced from polyacrylonitrile (PAN) precursor polymers through spinning, stabilization, carbonization, graphitization and surface-treatment processes, and subsequently formed into reinforced textile structures such as plain weave, twill, satin, stitched mats, multiaxial fabrics or pultruded sheet materials. Featuring a typical filament diameter of 5?10 microns, this material system offers extremely high specific strength and stiffness, excellent fatigue resistance, corrosion resistance and thermal stability, serving as the core reinforcement platform for advanced composite applications and high-end structural components. Performance grades?including High Strength (HS), Intermediate Modulus (IM), High Modulus (HM) and Ultra-High Modulus (UHM)?are reflected consistently across both carbon fiber tow and corresponding fabric products. PAN-based carbon fiber and fabrics are widely used in aerospace structures, automotive lightweighting, wind turbine blades,

rail transit components, civil-engineering strengthening, electronic device housings and sporting goods. In recent years, driven by global lightweighting and carbon-neutral trends, their penetration has accelerated in emerging fields such as new-energy vehicle structures, hydrogen storage and transportation vessels, and large-scale wind power blades.The cost structure of PAN-based carbon fiber and fabrics is characterized by PAN precursor accounting for roughly 20% of total cost, manufacturing expenses?including energy consumption, oxidation and carbonization losses, solvent recovery, equipment depreciation and surface-treatment chemicals?representing around 65%, and labor contributing approximately 15%. A typical carbon-fiber production line (from precursor spinning to carbonization) provides an annual capacity of 500?1,000 tons, while integrated high-end facilities may reach 1,000?2,000 tons per line. Fabric-production capacity varies widely depending on weave architecture, width and automation level, generally ranging from several tons to several tens of tons per year. Industry gross margins typically fall between 25% and 35%, and can exceed 40% for companies with in-house precursor supply, advanced continuous equipment and high-end aerospace-grade product portfolios.Within the industry value chain, upstream segments include acrylonitrile monomer, solvents such as DMF, auxiliaries and polymerization systems; midstream encompasses precursor fiber preparation, stabilization, carbonization, graphitization and fabric weaving; downstream extends to prepregs, molded components, pultruded structures and thermoset/thermoplastic composite products. Global production is concentrated in Japan, the United States and China, with leading companies such as Toray Industries, Mitsubishi Chemical, Teijin, Hexcel and SGL Carbon, alongside major Chinese producers including Zhongfu Shenying, Guangwei Composites and Jilin Chemical Fiber. While aerospace-grade products remain dominated by Japanese and U.S. manufacturers, Chinese companies continue to expand rapidly in industrial-grade large-tow products and mid-range structural applications such as wind turbine blades.Looking ahead, the PAN-based carbon fiber and fabric industry will continue advancing toward higher performance, lower energy consumption, greener processes and intelligent manufacturing. Key technological directions include low-energy stabilization, short-process carbonization, bio-based PAN precursors, solvent-free polymerization, carbon-fiber recycling (rCF) and automated spreading/weaving technologies. Downstream growth will be driven by aerospace upgrades, next-generation wind blades, hydrogen-storage composite cylinders, rail-transit structures and new-energy vehicle chassis systems. As global competition shifts from a few dominant players to a more regionally diversified landscape, technological barriers, equipment integration capability and vertically integrated industrial-chain layouts will define the competitive edge of future market leaders.

The global PAN-based Carbon Fiber and Fabrics market size was estimated at USD 8671.0 million in 2025 and is projected to grow at a compound annual growth rate (CAGR) of 7.50% during the forecast period.

This report offers a comprehensive and in-depth analysis of the global PAN-based Carbon Fiber and Fabrics market, covering all critical facets from a broad macroeconomic overview to detailed micro-level insights. It examines market size, competitive landscape, emerging development trends, niche segments, key drivers and challenges, as well as conducts SWOT and value chain analyses.

The insights provided enable readers to understand the competitive dynamics within the industry and formulate effective strategies to enhance profitability and market positioning. Additionally, the report presents a clear framework for evaluating the current status and future outlook of business organizations operating in this sector.

A significant focus of this report lies in the competitive landscape of the global PAN-based Carbon Fiber and Fabrics market. It offers detailed profiles of major players, including their market shares, performance metrics, product portfolios, and operational status. This enables stakeholders to identify leading competitors and gain a nuanced understanding of market rivalry and structure.

In summary, this report serves as an essential resource for industry participants, investors, researchers, consultants, and business strategists, as well as anyone planning to enter or expand their presence in the PAN-based Carbon Fiber and Fabrics market.

Global PAN-based Carbon Fiber and Fabrics Market: Market Segmentation Analysis

This research report provides a detailed segmentation of the market by region (country), key manufacturers, product type, and application. Market segmentation divides the overall market into distinct subsets based on factors such as product categories, end-user industries, geographic locations, and other relevant criteria.

A clear understanding of these market segments enables decision-makers to tailor their product development, sales, and marketing strategies more effectively to meet the unique needs of each segment. Leveraging market segmentation insights can significantly enhance targeted approaches, optimize resource allocation, and accelerate product innovation cycles by aligning offerings with the specific demands of diverse customer groups.

Key Company

Toray Industries, Inc.
Hexcel
Jilin Chemical Fiber Group
Mitsubishi Chemical
Teijin
Hyosung Advanced Materials
SGL Carbon
Zhongfu Shenying Carbon Fiber Co.,Ltd.
Weihai Guangwei Composites Co., Ltd.
Newtech Group Co., Ltd.
Aksa Carbon
Sinopec Shanghai Petrochemical Company Limited
Jiangsu Hengshen Co.,Ltd.
Sinofibers Technology Co., Ltd.
Formosa Plastic Group
Shanxi Gangke Carbon Materials Co., Ltd
Syensqo
UMATEX
Changsheng (Langfang) Technology Co., Ltd
Taekwang
Lanzhou Blue Star Fiber Co., Ltd
China National Petroleum Corporation Jilin Petrochemical Branch
Henan Yongmei Carbon Fiber Co., Ltd

Market Segmentation (by Type)

Small Tow
Large Tow

Market Segmentation (by Application)

Aerospace & Military
Wind Turbine Blades
Sports & Leisure
Pressure Vessels

Molding & Composite Materials
Automotive
Carbon-Carbon Composites
Construction
Electronics & Electrical
Others

Geographic Segmentation

North America (USA, Canada, Mexico)
Europe (Germany, UK, France, Russia, Italy, Rest of Europe)
Asia-Pacific (China, Japan, South Korea, India, Southeast Asia, Rest of Asia-Pacific)
South America (Brazil, Argentina, Columbia, Rest of South America)
The Middle East and Africa (Saudi Arabia, UAE, Egypt, Nigeria, South Africa, Rest of MEA)

Key Benefits of This Market Research:

Industry drivers, restraints, and opportunities covered in the study
Neutral perspective on the market performance
Recent industry trends and developments
Competitive landscape & strategies of key players
Potential & niche segments and regions exhibiting promising growth covered
Historical, current, and projected market size, in terms of value
In-depth analysis of the PAN-based Carbon Fiber and Fabrics Market
Overview of the regional outlook of the PAN-based Carbon Fiber and Fabrics Market:

Customization of the Report

In case of any queries or customization requirements, please connect with our sales team, who will ensure that your requirements are met.

Chapter Outline

Chapter 1 mainly introduces the statistical scope of the report, market division standards, and market research methods.

Chapter 2 is an executive summary of different market segments (by region, product type, application, etc), including the market size of each market segment, future development potential, and so on. It offers a high-level view of the current state of the PAN-based Carbon Fiber and Fabrics Market and its likely evolution in the short to mid-term, and long term.

Chapter 3 makes a detailed analysis of the market's competitive landscape of the market and provides the market share, capacity, output, price, latest development plan, merger, and acquisition information of the main manufacturers in the market.

Chapter 4 is the analysis of the whole market industrial chain, including the upstream and downstream of the industry, as well as Porter's five forces analysis.

Chapter 5 introduces the latest developments of the market, the driving factors and restrictive factors of the market, the challenges and risks faced by manufacturers in the industry, and the analysis of relevant policies in the industry.

Chapter 6 provides the analysis of various market segments according to product types, covering the market size and development potential of each market segment, to help readers find the blue ocean market in different market segments.

Chapter 7 provides the analysis of various market segments according to application, covering the market size and development potential of each market segment, to help readers find the blue ocean market in different downstream markets.

Chapter 8 provides a quantitative analysis of the market size and development potential of each region and its main countries and introduces the market development, future development prospects, market space, and capacity of each country in the world.

Chapter 9 shares the main producing countries of PAN-based Carbon Fiber and Fabrics, their output value, profit level, regional supply, production capacity layout, etc. from the supply side.

Chapter 10 introduces the basic situation of the main companies in the market in detail, including product sales revenue, sales volume, price, gross profit margin, market share, product introduction, recent development, etc.

Chapter 11 provides a quantitative analysis of the market size and development potential of each region in the next five years.

Chapter 12 provides a quantitative analysis of the market size and development

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potential of each market segment in the next five years.

Chapter 13 is the main points and conclusions of the report.

Key Reasons to Buy this Report:

Access to date statistics compiled by our researchers. These provide you with historical and forecast data, which is analyzed to tell you why your market is set to change
This enables you to anticipate market changes to remain ahead of your competitors
You will be able to copy data from the Excel spreadsheet straight into your marketing plans, business presentations, or other strategic documents
The concise analysis, clear graph, and table format will enable you to pinpoint the information you require quickly
Provision of market value data for each segment and sub-segment
Indicates the region and segment that is expected to witness the fastest growth as well as to dominate the market
Analysis by geography highlighting the consumption of the product/service in the region as well as indicating the factors that are affecting the market within each region
Competitive landscape which incorporates the market ranking of the major players, along with new service/product launches, partnerships, business expansions, and acquisitions in the past five years of companies profiled
Extensive company profiles comprising of company overview, company insights, product benchmarking, and SWOT analysis for the major market players
The current as well as the future market outlook of the industry concerning recent developments which involve growth opportunities and drivers as well as challenges and restraints of both emerging as well as developed regions
Includes in-depth analysis of the market from various perspectives through Porter?s five forces analysis
Provides insight into the market through Value Chain
Market dynamics scenario, along with growth opportunities of the market in the years to come
6-month post-sales analyst support

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