

Glass Fiber Textile in the Wind Energy Market Report: Trends, Forecast and Competitive Analysis to 2031

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Abstracts

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Glass Fiber Textile in the Wind Energy Trends and Forecast

The future of glass fiber textile in the global wind energy market looks promising with opportunities in the windmill blade and wind turbine hub markets. Glass fiber textile in the global wind energy market is expected to grow with a CAGR of 6.5% from 2025 to 2031. The major drivers for this market are the increasing demand for renewable energy, advancements in glass fiber technology, and rising government incentives and regulations.

Lucintel forecasts that, within the product type category, non-crimp is expected to witness the highest growth over the forecast period.

Within the application category, windmill blades are expected to witness higher growth.

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

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Emerging Trends in Glass Fiber Textile in the Wind Energy Market

Glass fiber textile in the wind energy market is evolving due to technological advances and changing industry demands. Emerging trends include the adoption of advanced materials, environmental sustainability, and greater offshore wind projects. These trends reflect efforts to enhance performance, reduce costs, and increase the scalability of wind energy systems.

Advancements in Material Technology: Wind turbines are being improved through the use of advanced glass fiber composites to enhance blade strength and durability. This trend includes the manufacture of woven and nonwoven textiles with improved mechanical properties, such as resistance to fatigue and environmental stress. These materials contribute to better blade performance, leading to lower blade maintenance and a longer operational life for wind turbines.

Sustainability and Recycling: Sustainability is a major trend, as many efforts in the wind industry strive to minimize the carbon footprint. Glass fiber textiles have been engineered to improve recyclability, and there is growing popularity in the use of green fibers. This aligns with policies and regulations aimed at minimizing the environmental impact of these technologies and addressing stringent regulations regarding the landfilling of wind turbine blades.

Increase in Offshore Wind Projects: The construction of offshore wind farms, particularly in the United States, Japan, and other European countries, is on the rise. Such projects often involve the use of wider and longer wind turbine blades, creating a need for advanced glass fiber composites. Offshore wind farms face significant challenges due to extreme weather, but these are gradually being solved through new material technologies with high anti-aging properties.

Digitalization and Smart Manufacturing: It is hard to imagine the production of glass fiber textiles without the integration of artificial intelligence and the Internet of Things (IoT) in manufacturing processes. Manufacturers can improve production lines and quality while lowering costs by incorporating smart technologies. This also helps meet the high-tailored requirements of wind turbine manufacturers, ensuring quicker and more efficient production.

Emerging Markets and Global Expansion: Countries such as India and Brazil are experiencing rapid growth in the use of wind power, providing potential markets for glass fiber textile manufacturers. As these markets develop their green energy infrastructure, the demand for composite materials such as glass fibers

will rise. This shift is encouraging competition and driving innovation in production and material supply.

These trends are revolutionizing the glass fiber textile in the wind energy market, offering better material performance, reducing environmental impact, and expanding the scope of wind energy projects on a global scale. As the market matures, producers are adapting to maintain their success, and glass fiber textiles will remain at the forefront of wind energy technology.

Recent Developments in Glass Fiber Textile in the Wind Energy Market

Glass fiber textile in the wind energy market has become dynamic as some key developments have taken place. Such as improvement in composite materials, supportive legislation on the development of wind energy, and the adoption of advanced manufacturing technologies. Consequently, presented below are the most important changes:

Better Blade Design and Improvement of Materials: Recent developments are focused on the enhancement of glass fiber composites as applied towards the optimization of turbine blade geometry. Innovations in the manufacturing process have resulted in the availability of longer blades which are light but more strong thereby increasing energy output. Such innovations assist in the reduction of turbine maintenance cycles and enhance the efficiency of wind farms.

Global Expansion of Offshore Wind Projects: It is observed that offshore wind projects are diversifying at an alarming rate with most regions of Europe, the U.S., and Japan taking the lead. Such projects utilize advanced glass fiber fabrics suitable for harsh ocean-based conditions. Consequently, there's an increasing need for advanced strong materials capable of withstanding the harsh offshore conditions, thus providing opportunities for companies in the textile sector to explore further these new possibilities.

Sustainability Initiatives and Eco-Friendly Materials: The need for ecological conservation has also resulted in the development of ways to manufacture polymer-based glass fiber composites that are capable of being recycled. The smart construction industry is also committed to creating low-waste glass fibers to replace those used in conventional construction. These technologies are in

keeping with the efforts in the industry which in the strict regulation of the use and maximal waste minimization concerning the use of power and production.

Digitalization in Production Processes: The market for glass fiber textiles is changing due to the inclusion of new technology such as 3D printing as well as Artificial intelligence-assisted manufacturing processes. These changes improve the accuracy and the versatility of the glass fibers textile market while at the same time ensuring performance efficiency in wind turbine usage and reduction of production cost and time.

Support for Wind Energy Development in Terms of Policies and Regulation: Countries such as China, The U.S., and Germany are all enacting legislation that encourages the development of Renewable Energy sources. Such policies complement glass fiber textiles demand in wind turbine production as they are essential in the building up of modern-day complex and robust structures for wind energy.

These changes underscore how active the glass fiber textile in the wind energy market remains. Advances in materials and manufacturing and sustainable development paradigms continue to propel the growth of the industry as markets continue widening. To that extent, these developments will ensure the glass fiber textile industry for wind energy applications continues thriving in this era of industry transformations.

Strategic Growth Opportunities for Glass Fiber Textile in the Wind Energy Market

The market for glass fiber textiles in the wind energy market has numerous strategic growth opportunities in different applications. These opportunities stem mostly from the technology, some regional policies, and the need for renewable energy on a global scale. Here are the five key opportunities:

Offshore Wind Energy Development: With the increasing importance of offshore wind farms comes significantly more need for glass fiber textiles in the manufacture of largescale and stronger turbine blades. Some offshore conditions require the use of polymers of P-77E or its derivatives, which are resistant to extreme weather environmental conditions and salt water as well as high pressure. This makes for high-defense glass fiber sash products that perform well when deployed offshore as this trend indicates.

Integration of Smart Materials in Wind Turbine Blades: Thus, the use of smart materials by incorporation of glass fiber textiles with sensors remains an avenue to improve the performance of wind turbines. These fabrics have the potential to monitor the condition of the blade in real time paving the way for effective management of maintenance and function of the whole generated unit. It is these manufacturers that are likely to benefit from this type of innovation when it is possible to offer such materials of this kind.

Emerging Markets Expansion: Developing countries like India, Brazil, and Southeast Asia are pouring their investments into renewable energy sources. These markets provide the opportunity for clearing out growing pains for glass fiber textile investments as well as provide the development of new wind turbine structures. As these areas seek to achieve the bars set for renewable energy there will be an increasing need for affordable and long-lasting materials for wind turbine components.

Eco-Friendly and Recyclable Fiber Materials: With a growing trend to establish a sustainable future in the global perspective, production companies can place more emphasis on green and recyclable glass fiber composites. This trend for sustainable materials is expected to create more growth opportunities, particularly in environmentally friendly countries.

Omer Materials supplier: Otherwise stated here Companies widening the scope of their activities or reorganizing themselves into flexible entities Otter Technologies. However, these projects fund most of the industrialization of the manufacturing of such advanced composites and the production of new markets for wind turbine structures and their parts.

The growth opportunities demonstrate the importance of glass fiber textiles in the wind energy market. With greater focus on offshore and smart materials, and on environmental and green construction trends, companies are likely to expand in the growing global market. The upcoming growth in the usage of advanced wind energy systems promises a positive outlook for the position of glass fiber textiles in the industry.

Glass Fiber Textile in the Wind Energy Market Driver and Challenges

The glass fiber textile in the wind energy market is shaped by several important drivers and challenges, attributed to factors such as advanced technologies, economic

conditions, and regulations, among others. All these dynamics either help or hamper the growth and sustainability of the market.

The factors responsible for driving glass fiber textile market in wind energy include:

Technological Innovations in Composite Materials: The performance of glass fiber composites is considered a key factor in market optimization due to technological advancements. These innovative glass fiber composites offer more performance benefits, such as superior strength, environmental stress toughness, and durability. These innovations help maximize the efficiency of turbine blades, decrease turbine downtime, and enhance the performance of wind turbines, thereby increasing the demand for glass fiber textiles.

Government Support for the Development of Alternative Energy Sources: Currently, it can be noted that countries worldwide are increasing their adoption of renewable energy. Government financial aid, reduced economic barriers to entry, and support for wind energy projects create demand for materials like glass fiber textiles. Governments, especially in the US, Europe, and China, are increasing investments in renewable energy infrastructure, which, in turn, spurs the growth of the market for these textiles.

Escalating Offshore Wind Market: Offshore wind energy is becoming increasingly important because it is more efficient and requires less land. This growth is also increasing the demand for specialized materials, such as high-performance glass fiber textiles, to be used in the harsh offshore environment. Offshore wind projects are expected to remain a key factor in this market for many years to come.

Constant Development of Green and Recyclable Materials: Growing environmental concerns are contributing to the creation of recyclable glass fiber composites. This trend supports government policies and consumer demand for environmentally friendly products, highlighting the growth opportunities in the glass fiber textile market.

Global Deployment of Wind Energy Facilities: As countries invest in renewable energy resources, there is a global proliferation of construction, opening new markets for glass fiber textiles. Countries like India, Brazil, and Southeast Asia are improving their renewable energy capabilities, which will translate into increased demand for high-quality and durable materials in the wind turbine

manufacturing industry.

Challenges in glass fiber textile market in wind energy include:

High Production Costs: In the glass fiber textile industry, the cost of production is a major hindrance. The process of manufacturing glass fibers is labor-intensive and requires a significant amount of energy, making them expensive. This presents a market barrier, particularly for small-scale producers and newly developing economies.

Material Limitations and Durability Issues: While glass fiber textiles provide insulation, there are still limitations, particularly with exposure to UV light, moisture, and humidity, especially in dry offshore environments. The current materials do not perform as required, and this is a challenge that manufacturers are seeking to address through new manufacturing approaches.

Constraints on Supply Chain Management: With the global economy, the availability of logistics for glass fiber textiles is hampered by issues such as raw material scarcity and delays in transportation. These restrictions lead to increased costs, production delays, and limitations in expanding production capacity, all of which may slow market progress.

Glass fiber textile in the wind energy market is positively influenced by advances in technology, supportive policies, and the growing demand for renewable energy. However, there are risks to the industry's growth due to challenges such as high production costs, material constraints, and supply chain disruptions. Managing these factors effectively is crucial to maintaining long-term prosperity in this market.

List of Glass Fiber Textile Companies in the Wind Energy 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 glass fiber textile companies in the wind energy industry cater increasing demand, ensure competitive effectiveness, develop innovative products & technologies, reduce production costs, and expand their customer base. Some of the glass fiber textile companies in the wind energy industry profiled in this

report include-

Owens Corning

Jushi Group

Chongqing Polycomp International Corporation

Taishan Fiberglass

Taiwan Glass Group

Nippon Electric Glass

Sichuan Weibo

3B the Fiber Glass Company (Goa Glass Fiber)

Johns Manville Corporation

Nitto Boseki

Glass Fiber Textile in the Wind Energy Market by Segment

The study includes a forecast for glass fiber textile in the wind energy market by product type, application, and region.

Glass Fiber Textile in the Wind Energy Market by Product Type [Analysis by Value from 2019 to 2031]:

Woven Roving

Non-Crimp

Woven Yarn

CFM/CSM

Glass Fiber Textile in the Wind Energy Market by Application [Analysis by Value from 2019 to 2031]:

Windmill Blades

Wind Turbine Hubs

Others

Glass Fiber Textile in the Wind Energy Market by Region [Analysis by Value from 2019 to 2031]:

North America

Europe

Asia Pacific

The Rest of the World

Country Wise Outlook for Glass Fiber Textile in the Wind Energy Market

Glass fiber textile in the wind energy market is currently on a growth trajectory due to increased efforts toward renewable energy sources. Glass fibers are extensively used in wind turbine blades because they have high strength, durability, and lightness, making them optimal for maximizing wind power harnessing. As countries such as the USA, China, Germany, India, and Japan focus on expanding their wind energy capacity, the consumption of glass fiber textiles is increasing. Each country, in turn, has taken different approaches to accelerate the development of wind energy, which, in return, shapes the demand for these materials in different ways.

United States: In the U.S., the regional glass fiber textile market for wind energy is supported by government incentives and a growing appetite for renewable energy sources. The country is planning to build more wind energy projects and is investing heavily in offshore wind farms on the East Coast. This has increased the demand for advanced glass fiber textiles for turbine blades, which are produced significantly in the country. Additionally, more glass fiber technology is

being adopted to enhance the efficiency of the blades and reduce material costs. The U.S. is also exploring sustainable fiber material options as wind energy is being prioritized.

China: China continues to lead the global wind energy market and is the largest consumer of glass fiber composites. As the country plans further development of onshore and offshore wind farms, the demand for quality composite materials, such as glass fiber composites, is increasing. The government's push to reduce carbon emissions has also contributed to the rapid enhancement of alternative energy sources, creating demand for reliable, lightweight, and strong wind turbine components. Chinese producers are finding ways to lower production costs for glass fiber composites, boosting both domestic and international markets.

Germany: The wind energy sector in Germany is evolving under its 'Energiewende' strategy, which focuses on moving away from nuclear and fossil fuels. Germany is geographically one of the largest markets for wind energy in Europe, and as such, has made significant progress in improving the efficiency of larger wind turbine blades, which requires advanced glass fiber textiles. The country's engineering and technology capabilities promote the development of materials used to manufacture long-lasting, maintenance-friendly blades with better aerodynamic efficiency.

India: India is making significant strides in harnessing wind energy to meet its renewable energy goals. The country has vast wind potential, especially in its coastal areas, which has led to the rise of wind energy farms and increased demand for glass fiber textiles in the manufacture of wind turbines. The Indian government is encouraging wind energy development by offering policy incentives that attract overseas investment. More domestic companies are using high-end glass fiber composites to improve turbine performance and reduce operating costs. With a focus on cost-efficiency, India is expected to see meaningful growth in its wind energy market, further increasing the consumption of glass fiber textiles.

Japan: Japan has turned to offshore wind energy as a solution for reducing greenhouse gas emissions and achieving energy security. There is also a growing demand for robust glass fiber textiles in Japan due to the high requirements for durable materials in offshore wind farm construction. Turbine blade technology is being improved, and Japan is seeking innovations for blades

that can operate in rough sea conditions. The focus on technology development, combined with the country's ambitious renewable energy goals, has made Japan a rapidly evolving market for glass fiber textiles.

Features of Glass Fiber Textile in the Global Wind Energy Market

Market Size Estimates: Glass fiber textile in the wind energy market size estimation in terms of value (\$B).

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

Segmentation Analysis: Glass fiber textile in the wind energy market size by product type, application, and region in terms of value (\$B).

Regional Analysis: Glass fiber textile in the wind energy 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 glass fiber textile in the wind energy market.

Strategic Analysis: This includes M&A, new product development, and competitive landscape of the glass fiber textile in the wind energy market.

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

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This report answers following 11 key questions:

Q.1. What are some of the most promising, high-growth opportunities for glass fiber textile in the wind energy market by product type (woven roving, non-crimp, woven yarn, and cfm/csm), application (windmill blades, wind turbine hubs, 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?

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7.8: 3B the Fiber Glass Company (Goa Glass Fiber)

7.9: Johns Manville Corporation

7.10: Nitto Boseki

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