

Wind Turbine Composite Materials Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025 - 2034

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Report description:

The Global Wind Turbine Composite Materials Market reached USD 14.3 billion in 2024 and is expected to grow at a robust CAGR of 6.5% from 2025 to 2034. As the world's demand for renewable energy solutions continues to rise, the need for innovative materials to produce efficient wind turbines becomes increasingly critical. Composite materials play an essential role in the design and production of wind turbine blades, nacelles, and other key components. Their remarkable combination of strength, lightness, and durability makes them ideal for the harsh operating conditions faced by wind turbines. These materials not only help improve the performance and longevity of turbines but also contribute to making wind energy more cost-effective and sustainable. With renewable energy projects expanding globally, the demand for composite materials in wind turbine manufacturing is set to increase, accelerating industry growth.

The market for wind turbine composite materials is primarily segmented by fiber type, with carbon fiber, glass fiber, and others as the key categories. Of these, glass fiber leads the market, generating USD 9.2 billion in revenue in 2024. This segment is also expected to experience the fastest growth due to its cost-effectiveness and exceptional versatility. Glass fiber offers superior tensile strength, corrosion resistance, and a lightweight design, which are critical attributes for producing efficient and durable turbine blades and nacelles. As the wind energy sector increasingly focuses on improving turbine performance, there is a growing demand for longer, more durable blades, which in turn drives the adoption of glass fiber-reinforced composites.

Another key market segment is based on manufacturing methods, which include hand lay-up, vacuum injection molding, prepreg, and others. Among these, vacuum injection molding commands the largest market share, accounting for 44.3% in 2024. This manufacturing process is gaining traction due to its ability to produce large-scale components with superior mechanical properties and fewer defects. Vacuum injection molding is particularly effective in crafting turbine blades, as it offers precision, durability, and the lightweight characteristics necessary to improve energy efficiency. Furthermore, the technique allows for enhanced resin penetration, reduced material waste, and faster production speeds, meeting the growing demand for scalable and cost-efficient manufacturing in the wind energy sector.

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In the United States, the wind turbine composite materials market was valued at USD 4.2 billion in 2024. This market is experiencing impressive growth, fueled by the nation's strong push toward renewable energy adoption and its commitment to transitioning to a low-carbon economy. Federal policies, including tax credits and incentives for wind energy projects, have played a significant role in boosting wind farm installations, thus driving the demand for composite materials used in turbine production. In addition, advancements in manufacturing technologies and the presence of domestic suppliers of composite materials have further supported market expansion, enhancing cost-efficiency and ensuring the continued growth of the wind energy industry in the U.S.

Table of Contents:

Report Content

Chapter 1 Methodology & Scope

- 1.1 Market scope & definitions
- 1.2 Base estimates & calculations
- 1.3 Forecast calculations
- 1.4 Data sources
 - 1.4.1 Primary
 - 1.4.2 Secondary
 - 1.4.2.1 Paid sources
 - 1.4.2.2 Public sources

Chapter 2 Executive Summary

- 2.1 Industry synopsis, 2021-2034

Chapter 3 Industry Insights

- 3.1 Industry ecosystem analysis
 - 3.1.1 Factor affecting the value chain
 - 3.1.2 Profit margin analysis
 - 3.1.3 Disruptions
 - 3.1.4 Future outlook
 - 3.1.5 Manufacturers
 - 3.1.6 Distributors
- 3.2 Supplier landscape
- 3.3 Profit margin analysis
- 3.4 Key news & initiatives
- 3.5 Regulatory landscape
- 3.6 Impact forces
 - 3.6.1 Growth drivers
 - 3.6.1.1 Increasing demand for renewable energy
 - 3.6.1.2 Technological advancements in composite materials
 - 3.6.1.3 Cost reduction and efficiency improvement
 - 3.6.2 Industry pitfalls & challenges
 - 3.6.2.1 High initial investment
 - 3.6.2.2 Durability and long-term performance
- 3.7 Growth potential analysis
- 3.8 Porter's analysis
- 3.9 PESTEL analysis

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Chapter 4 Competitive Landscape, 2024

4.1 Introduction

4.2 Company market share analysis

4.3 Competitive positioning matrix

4.4 Strategic outlook matrix

Chapter 5 Market Estimates & Forecast, By Fiber Type, 2021-2034 (USD Billion) (Kilo Tons)

5.1 Key trends

5.2 Glass fiber

5.3 Carbon fiber

5.4 Others (aramid fiber, basalt fiber)

Chapter 6 Market Estimates & Forecast, By Technology, 2021-2034 (USD Billion) (Kilo Tons)

6.1 Key trends

6.2 Vacuum injection molding

6.3 Prepreg

6.4 Hand lay-up

6.5 Other (autoclave molding, filament winding)

Chapter 7 Market Estimates & Forecast, By Application, 2021-2034 (USD Billion) (Kilo Tons)

7.1 Key trends

7.2 Wind blades

7.3 Nacelles

7.4 Others (internal components, spinners and hub covers)

Chapter 8 Market Estimates & Forecast, By Region, 2021-2034 (USD Billion) (Kilo Tons)

8.1 Key trends

8.2 North America

8.2.1 U.S.

8.2.2 Canada

8.3 Europe

8.3.1 UK

8.3.2 Germany

8.3.3 France

8.3.4 Italy

8.3.5 Spain

8.3.6 Russia

8.4 Asia Pacific

8.4.1 China

8.4.2 India

8.4.3 Japan

8.4.4 South Korea

8.4.5 Australia

8.5 Latin America

8.5.1 Brazil

8.5.2 Mexico

8.6 MEA

8.6.1 South Africa

8.6.2 Saudi Arabia

8.6.3 UAE

Chapter 9 Company Profiles

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- 9.1 AOC Aliancys
- 9.2 Evonik Industries
- 9.3 Gurit Holding
- 9.4 Henkel
- 9.5 Hexcel Corporation
- 9.6 Hexion
- 9.7 Huntsman
- 9.8 Mitsubishi Chemical
- 9.9 Owens Corning
- 9.10 SABIC
- 9.11 SGL Carbon
- 9.12 Solvay
- 9.13 Teijin Limited
- 9.14 Toray Industries
- 9.15 Zoltek Companies

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