

Epoxy Glass Market By End Use Industry (Aerospace and Defense, Automotive and Transportation, Electrical and Electronics, Wind Energy, Sporting Goods, Marine, Pipe and Tank, Others): Global Opportunity Analysis and Industry Forecast, 2023-2032

Market Report | 2023-08-01 | 206 pages | Allied Market Research

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Report description:

The global epoxy glass market was valued at \$12.7 billion in 2022, and is projected to reach \$24.6 billion by 2032, growing at a CAGR of 6.9% from 2023 to 2032.

Epoxy glass is a composite material produced by combining epoxy resin with woven glass fabric. It is also known as FR4 or fiberglass-reinforced epoxy. This combination produces a composite material by combining the strengths of glass fibers with the adhesive and stiff properties of epoxy resin after being injected within the glass fabric and afterwards curing in regulated conditions. Epoxy glass is used in various sectors, including electronics, aviation, automotive, construction, and others.

Epoxy glass is employed more often across a range of industries due to their great mechanical properties, resistance to chemicals and corrosion, durability, and exceptional electrical insulation characteristics leading to the growth of the market. Epoxy glass is utilized in the marine sector owing to its superior mechanical qualities and resilience to external influences. It is widely used in boat and ship construction due to its great combination of strength, light weight, and corrosion resistance. As it has a high tensile strength and is coated with epoxy resin, the woven glass fabric is a great option for hulls, decks, and other structural elements. This improves the overall structural integrity of boats while keeping their weight in control, which helps them move more easily and use less fuel.

One of epoxy glass's key advantages in the marine industry is its resistance to water, salt, and various chemicals usually found in marine conditions. This feature, which helps to stop deterioration, extends the lifespan of marine projects. Since it provides effective insulation against electrical currents, epoxy glass is suitable for applications on ships involving wiring, control panels, and electronic equipment. In addition, epoxy glass is used to construct marine parts including radomes, antenna covers, and communication dishes. It is the ideal choice for preserving dependable communication and navigation systems at sea owing to its

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dielectric features, that enable signals to be sent with minimal interference. Moreover, the use of epoxy glass improves maintenance and repair of marine vessels easily. Its adhesive properties allow for the smooth bonding of broken pieces, preserving the vessel's structural integrity. Also, the versatility of epoxy glass helps for modification and adaptability to intricate nautical designs.

Epoxy glass is used to build subsea machinery and pipelines in offshore sectors like oil and gas exploration. It is the most suitable means of maintaining the durability and lifespan of these crucial components as to its resistance to corrosion, pressure, and extreme underwater environments. Owing to these factors, epoxy glass is an integral part in the marine sector that drives the growth of the market.

The surge in renewable energy also drives the growth of epoxy glass market. Epoxy glass is the ideal material for constructing wind turbine blades, which are fundamental components in harnessing wind energy for electricity generation. It is used in wind energy owing to its high mechanical strength-to-weight ratio. Wind turbines' blades must be light and durable to withstand the dynamic loads and stresses brought on by shifting wind speeds and turbulence to effectively collect wind energy. Epoxy glass composites, which combine the robustness of glass fibers with the light weight of epoxy resin, create this balance by producing blades that can survive challenging conditions while effectively converting wind energy into electricity.

Wind turbine blades are exposed to various meteorological elements, such as rain, UV rays, and temperature changes. The blades' extended life provides lower maintenance and replacement costs due to epoxy glass' natural resistance to weathering, corrosion, and UV deterioration. For wind farms situated in distant or offshore regions, where maintenance might be difficult and expensive to do, the durability of epoxy glass is especially important.

The excellent electrical insulating properties of epoxy glass enable its use in wind energy. Wind turbine blades usually include sensors, heating elements, and control systems for performance monitoring and management. Epoxy glass reduces electrical leakage and interference, ensuring the safe and dependable operation of these components. Owing to these factors, the rise in demand for renewable energy, particularly wind energy, stimulated the growth of the epoxy glass market.

The high manufacturing cost of epoxy glass restrains the market growth. Epoxy glass is produced by mixing the specialized materials epoxy resin and woven glass fabric. Glass fabric must be woven to precise specifications, while epoxy resin is a polymer that requires precision formulation and processing. The cost of production increases as these materials are costly.

Epoxy glass is created in many ways, such as by coating glass fabric with epoxy resin, curing it under controlled conditions, and even adding shaping and finishing techniques. These operations require specialized equipment, knowledge, and controlled environments, which increases operational costs. Furthermore, rigid quality control procedures are needed to ensure epoxy glass products are of consistently high quality. The mechanical qualities and performance of the finished product can be impacted by changes to other parameters, such as the resin-to-fiber ratio, curing conditions, or other factors. By requiring more testing, inspection, and rework, strict quality control drives up manufacturing costs.

Epoxy glass production may result in waste, both in terms of additional materials used and energy used. The production process is more expensive as proper disposal and adherence to environmental rules are required. Products made of epoxy glass might be delicate, so damage prevention measures must be taken when handling them during storage and shipping. Costs associated with logistics are influenced by these factors. Owing to these reasons, high production cost limits the growth of the epoxy glass market.

The advancements in the manufacturing process created an excellent growth opportunity for the epoxy glass market. These advancements have led to more precise control over the manufacturing process and the development of new techniques, expanding the range of applications for epoxy glass. Traditional techniques involve manually setting up glass fabric and impregnating it with epoxy resin, which demands an immense amount of time and effort. Robotic systems precisely place and saturate the fabric with resin due to advancements in automation technology. By doing this, the possibility of human mistake is decreased, and consistency in resin distribution and fabric alignment is improved, leading to composite constructions that are stronger and more consistent.

The production of epoxy glass and other composite materials uses additive manufacturing techniques. Since complicated and customized structures are created layer by layer using 3D printing, it offers flexibility in design and reduces waste compared to traditional subtractive procedures. Furthermore, the improvement of material characteristics has been made possible by the addition of nanomaterials, such as nanoparticles and nanofibers, into epoxy resin. Epoxy glass composites have their mechanical

strength, thermal conductivity, and electrical characteristics enhanced by nanomaterials, making them even more useful in a variety of settings. Owing to these factors, the technological advancements in the manufacturing of epoxy glass presented a lucrative growth opportunity for the market.

The epoxy glass market is segmented by end-use industry and region. Depending on end-use industry, the market is classified into wind energy, aerospace & defense, sporting goods, automotive & transportation, electrical & electronics, pipe & tank, marine, and others. Region wise, the market is analyzed across North America, Europe, Asia-Pacific and LAMEA.

The key players operating in the global epoxy glass market are Axiom Materials, Inc., B.B.Chatterjee Company Private Limited, Harnawa Inc., Hexcel Corporation, Industrial Electrical Engineering Company, ISOSPORT Verbundbauteile GmbH, Panasonic Holdings Corporation, PARK AEROSPACE CORP., Shibaam Polymers, and Ventec International Group.

Key Benefits For Stakeholders

? This report provides a quantitative analysis of the market segments, current trends, estimations, and dynamics of the epoxy glass market analysis from 2022 to 2032 to identify the prevailing epoxy glass market opportunities.

? The market research is offered along with information related to key drivers, restraints, and opportunities.

? Porter's five forces analysis highlights the potency of buyers and suppliers to enable stakeholders make profit-oriented business decisions and strengthen their supplier-buyer network.

? In-depth analysis of the epoxy glass market segmentation assists to determine the prevailing market opportunities.

? Major countries in each region are mapped according to their revenue contribution to the global market.

? Market player positioning facilitates benchmarking and provides a clear understanding of the present position of the market players.

? The report includes the analysis of the regional as well as global epoxy glass market trends, key players, market segments, application areas, and market growth strategies.

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? Quarterly Update and* (only available with a corporate license, on listed price)

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Possible Customization with this report (with additional cost and timeline talk to the sales executive to know more)

? Product Benchmarking / Product specification and applications

? Upcoming/New Entrant by Regions

? Market share analysis of players by products/segments

? New Product Development/ Product Matrix of Key Players

? Regulatory Guidelines

? Additional company profiles with specific to client's interest

? Additional country or region analysis- market size and forecast

? Average Selling Price Analysis / Price Point Analysis

? Criss-cross segment analysis- market size and forecast

? Historic market data

? Key player details (including location, contact details, supplier/vendor network etc. in excel format)

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- ? List of customers/consumers/raw material suppliers- value chain analysis
- ? Market share analysis of players at global/region/country level
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- Key Market Segments
- By End Use Industry
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- ? Automotive and Transportation
- ? Electrical and Electronics
- ? Wind Energy
- ? Sporting Goods
- ? Marine
- ? Pipe and Tank
- ? Others
- By Region
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- ? U.S.
- ? Canada
- ? Mexico
- ? Europe
- ? Germany
- ? France
- ? UK
- ? Italy
- ? Rest of Europe
- ? Asia-Pacific
- ? China
- ? Japan
- ? India
- ? South Korea
- ? Rest of Asia-Pacific
- ? LAMEA
- ? Brazil
- ? Saudi Arabia
- ? South Africa
- ? Rest of LAMEA
- ? Key Market Players
- ? Hexcel Corporation
- ? Panasonic Holdings Corporation
- ? Axiom Materials, Inc.
- ? B.B.Chatterjee Company Private Limited
- ? Industrial Electrical Engineering Company
- ? Harnawa Inc.
- ? Shibaam Polymers
- ? ISOSPORT Verbundbauteile GmbH
- ? PARK AEROSPACE CORP.
- ? Ventec International Group

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