Composites Market

Market Scenario and Competitive Landscape

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Disclaimer

Introduction and Methodology

"Market Scenario" is a customized and organized analysis to gather information about target markets and competitive landscape in a particular sector.

"Market Scenario" provides relevant information to identify and analyzes market needs, market size and competition in the fields of interest of the customer. A technology or a product developed by the customer can be characterized according to the sectors and potentiality of application, target market, competitive advantages and potential partners of the technology. The analysis is performed with the application of technology and business intelligence tools. The research in the information providers is usually based on the use of keywords or by thematic area, according to the specific topic of interest.

The results of the assessment are data about the target or global market potential, market value and applicability of the technologies or products developed by the customer, the trends of the market of interest, the segmentation of the market (e.g., by application, geography or indication), the supply chain and the competitive advantages of products or technologies, the key players active in the market of interest and the possible direct or indirect competitors of the customer.

Context

This report provides data and trends about the **global composites market**, about the market segmentations by resin type, manufacturing process, fiber type, end-use industry and region and about the competitive landscape.

1 Composites Market

A **composite** material is a mixture of two different materials with different properties, such as mechanical, micro-cracking, and fatigue resistance, remarkable tensile strength, electrical conductivity, and high strength-to-weight ratio, which, when combined, offers an end-product with superior properties.

Polymer matrix composites are composed of reinforcement fibers bound together by polymer matrix resins. Various fibers (glass, carbon, natural, and others) and polymer matrix (thermoset and thermoplastic) can be used in composites depending on applications and the required specifications. End-use industries of composites are used in several end-use industries, including aerospace and defense, transportation, wind energy, marine, pipes and tanks, construction and infrastructure and electrical & electronics.

1.1 Global Market and Market Dynamics

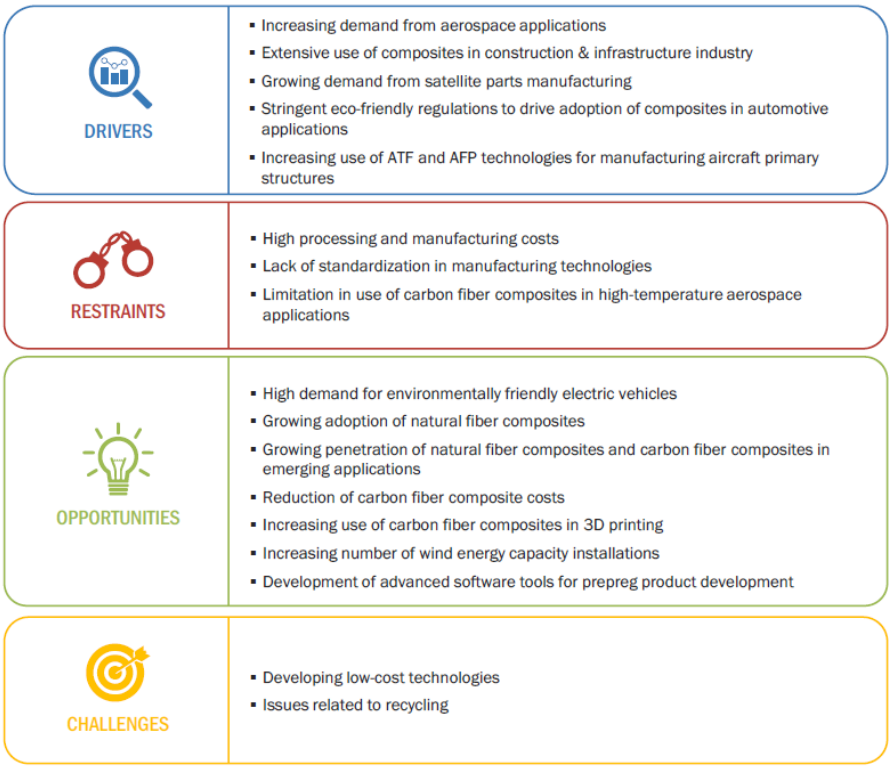
The **global composites market** is projected to register a CAGR of 8.2% between 2022 and 2027 and is projected to reach USD 168.6 billion by 2027.

The global composites market growth measured in **kilotons** is reported in Figure 1.

Figure 1. Global Composites Market in the Period 2022 – 2027 (Kilotons)

The composites market is expected to witness significant **growth** during the forecast period, thanks to its increasing applications in the automotive, aerospace and defense, construction and other end-use industries. Tax incentives and low crude oil prices are further pushing the growth of the composites market. The market has many big players, along with multiple small players, which makes it competitive. The increasing number of wind installations and aircraft deliveries worldwide is expected to enhance the demand for composites in respective end-use industries, driving the market. The demand for composites from the transportation industry is expected to increase due to the growth in the transportation industry and stringent eco-friendly regulations for producing more lightweight and fuel-efficient vehicles.

Figure 2. Drivers, Restraints, Opportunities and Challenges in Composites Market



The composites market is highly capital-intensive; therefore, the entry **barriers** are high. Existing players have a strong foothold in the market. Owing to the exceptional properties offered by composites, conventional materials such as aluminum steel are preferred less in high-performance applications in several end-use industries. Since the number of suppliers of these raw materials is high, the switching cost is low for key players. The competitive rivalry is high due to the presence of many key players and high exit barriers. Moreover, the high cost of raw materials is a major factor inhibiting market growth. The raw materials required are fibers and resins, which are more expensive than traditional materials. Cost reduction is not feasible as it is essential to maintain the quality of products required for high-end applications. The manufacturing process of composites is complex. Therefore, extensive R&D is also required at the micro-level to achieve economies of scale.

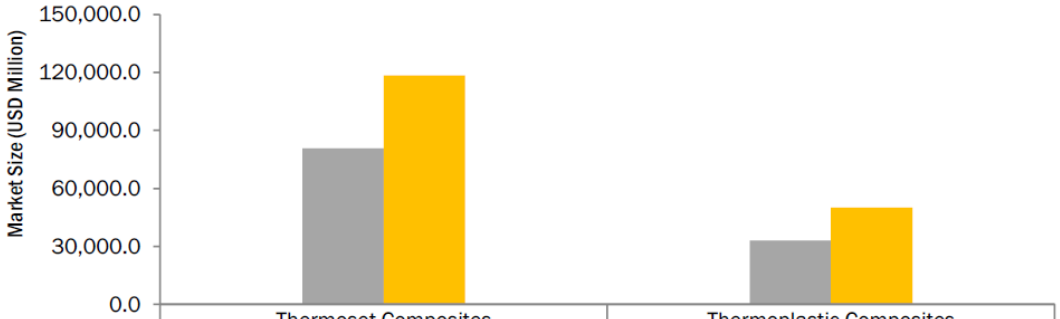
1.2 Market by Resin Type

The composites market is segmented based on **resins** into **two types**: **thermoset** composites and **thermoplastic** composites (Figure 3). Thermoset and thermoplastic resins are used as the matrix with fibers to produce various composites. Thermoset composites have a larger market share than thermoplastic composites because of their low cost and high performance. For instance, thermoset composites are resistant to heat and high temperatures. Thus, they have more uses in transportation and aerospace and defense end-use industries that require temperature-resistant materials.

The **thermoset** composites segment accounted for a larger share, in terms of value and volume, of the global composites market in 2021. These composites are widely used in construction and infrastructure, marine, wind energy, transportation, and other end-use industries such as sporting goods and medical. Thermoset composites do not expand under high-heat and moist conditions, making them suitable for highly corrosive and high-temperature applications. For instance, thermoset composites are used in monocoque, brake lines, suspension, and propeller shafts.

On the other hand, the processing cost of **thermoplastic** is high for various end-use industries, which makes them expensive. Since thermoplastic composites are easy to remold, reform, and reuse, the companies are investing in R&D for the mass production of thermoplastic composites to reduce their cost. This is expected to drive the market for thermoplastic composites during the forecast period.

Figure 3. Composites Market by Resin Type, in the Period 2022 - 2027



	Thermoset Composites	Thermoplastic Composites
2022	80,680.4	32,981.2
2027	118,507.1	50,051.1
CAGR (2022–2027)	8.0%	8.7%

1.3 Market by Manufacturing Process

The following table describes the various processes preferred for manufacturing composites. The choice of the composite manufacturing process largely depends on the shape and the dimensions of the structural components to be manufactured. The global composites market is categorized into several segments based on the manufacturing process: **lay-up, filament winding, injection molding, compression molding, RTM, pultrusion**, and others. These processes produce lightweight composites with a high strength-to-weight ratio, good surface quality, high dimensional tolerance, and composite structural parts.

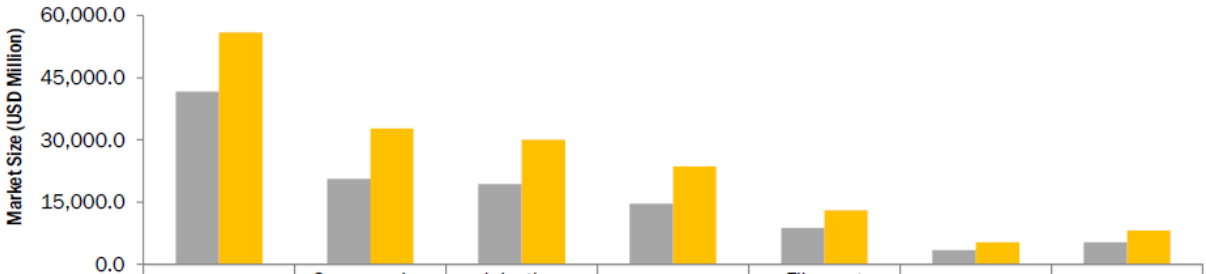
Table 1. Comparative Study of Major Composite Manufacturing Processes

MANUFACTURING PROCESSES	ADVANTAGES	DISADVANTAGES	APPLICATIONS
Lay-up	Can be used with long fibers, involve low cost, and less curing time	Lack of consistency; quality of the product is highly dependent on the skill of the laminator	Wind energy, **marine**, transportation, consumer goods, and construction & infrastructure
Filament Winding	Appropriate for hollow, circular, or oval sectioned components such as Pipes & Tanks	High cost and longer curing cycle time	Pipes & Tanks (compressed gas storage tanks or pipeline sections, struts, axles, and drive shafts)
Pultrusion	Yields smooth finished parts that do not require post-processing. Can be custom-tailored to fit specific applications	Limited to components with constant or near-constant Cross-sections: the cost of the heated die can be high	**Wind** energy (blade) and construction & infrastructure
Compression Molding	Simple, relatively fast cycle times, high repeatability, and high-volume production	Large initial capital investments in molds and presses and minor defects as a result of residual stresses, delamination, warpage, and flow orientation of fibers	Automotive (non-structural automobile applications such as interiors, closures, and miscellaneous parts)
Resin Transfer Molding	Used in the fabrication of complex, large scale integrated automobile structural parts	Expensive and generally limited to smaller components; Can lead to producing expensive scrap parts	Automotive (body frame, chassis/suspension, roof, and hood applications) and aerospace & defense
Injection Molding	Versatile, low cost, and offers high-volume production means for thermoplastic resin parts reinforced with fibers	Long cycle time	Aerospace & defense and automotive
Prepreg-autoclave	Accurate composition of fiber and resin can be achieved; Potential for automation and labor-saving; Complex lay-ups can be readily achieved	Autoclaves are required to cure the components, which are expensive, slow to operate, and limited in size	Aircraft structural components (wings and tail sections), F1 racing cars
Prepreg-out of Autoclave			**Wind** energy (wind-turbine blades), transportation, aerospace & defense (rescue craft)

The choice of the composite manufacturing process largely depends on the shape and the dimensions of the structural components to be manufactured. The global composites market is categorized into several segments based on **manufacturing process**: **lay-up, filament winding, injection molding, compression molding, RTM and pultrusion** (Figure 4). These processes enable manufacturers to produce lightweight composites with a high strength-to-weight ratio, good surface quality, high dimensional tolerance, and composite structural parts. Manufacturers can adopt any of the manufacturing processes based on applications. For instance, composites manufactured through the lay-up process are most preferably used in wind energy, marine, and aerospace & defense industries.

The RTM process for manufacturing composites is expected to register the highest CAGR during the forecast period due to high compatibility with automotive, construction and infrastructure, and aerospace structures. It is the most promising technology as it can yield large, complex, three-dimensional components with high mechanical performance, tight dimensional tolerance, and a high surface finish.

Figure 4. Composites Market by Manufacturing Process, in the Period 2022 – 2027



	Lay-Up	Compression Molding	Injection Molding	RTM	Filament Winding	Pultrusion	Others
2022	41,617.8	20,573.6	19,315.7	14,564.0	8,833.3	3,459.2	5,297.9
2027	55,923.5	32,733.2	29,994.5	23,583.0	12,991.3	5,242.2	8,090.5
CAGR (2022–2027)	6.1%	9.7%	9.2%	10.1%	8.0%	8.7%	8.8%

Others segment includes vacuum bagging and pressure bagging, 3D printing and continuous laminating

The **lay-up** process accounted for the largest share of the composites market, in terms of value and volume, in 2021. This high market share is due to the increased demand from wind energy, marine, and aerospace & defense end-use industries. The lay-up process includes hand lay-up and spray-up, widely used for composite component manufacturing in the aerospace & defense, wind energy, and marine industries. Due to its low cost, the lay-up process is widely used for manufacturing composite parts for wind energy, construction & infrastructure, transportation, consumer goods, and marine applications. In lay-up process, the orientation of fibers can be controlled as needed so that they can absorb the maximum stresses to which they are subjected. This is a low-cost method with advantages such as rapid deposition of fiber & resin and ease of operation. The lay-up process is mostly used for designing simple enclosures and lightly loaded structural panels. Its demand is huge from the aerospace & defense, construction & infrastructure, wind energy, and marine end-use industries.

Filament winding is an automated open molding process in which a rotating mandrel is used as a mold to produce an inner surface and a laminate surface on the outside of the product. This process offers a high degree of fiber loading and thus produces high strength-to-weight ratio laminates. It is a very quick and economical method for manufacturing composites. This process is automated and used to make structures that are highly engineered. It produces hollow or circular components such as compressed air tanks, high-pressure CO_2 tanks & bottles, water softener systems, rescue air tanks, sailboat masts, compressed natural gas tanks, light poles, and construction materials.

Injection molding is a fast, high-volume, closed molding process that uses, most commonly, reinforced thermoplastics composites such as nylon with chopped glass fiber. It is used for producing parts by injecting molten material into mold. The material is fed into a heated barrel, mixed, and injected into a mold cavity. This process offers low-cost tooling, which is economical for low production volumes or large parts production. It is widely applicable in the transportation and electrical & electronics industries to produce bumpers for vehicles, panels for electrical equipment, enclosures for medical devices, and others.

Pultrusion is a low-cost, high-speed, automated, and versatile cross-sectional shape process. It is used to make various complex shapes. In this process, reinforcement materials such as fibers are impregnated with resin. This is followed by a separate performing system and pulled through a heated stationary dye, where the resin undergoes polymerization. The dye completes the impregnation of fiber, controls the resin content, and cures the material into its final shape as it passes through the dye. Its applications include door & window frames, rails & fences, and bridges, where a firm structure is required.

The **compression molding process** is used to manufacture large quantities of complex composite parts. It requires low investment, and the products made through this process can potentially last for decades with minimal maintenance. It has fast molding cycles and high part uniformity. It produces a more consistent set of products, which is incredibly important for high-volume productions. The compression molding manufacturing process also provides design flexibility and smooth finished surface areas. This process is widely applicable for glass fiber-reinforced composites and carbon fiber-reinforced composites products in end-use industries such as transportation, construction & infrastructure, and aerospace & defense. The compression molding process is used in automotive parts such as door systems, load-bearing chassis, pillars, and structural interiors in the transportation end-use industry.

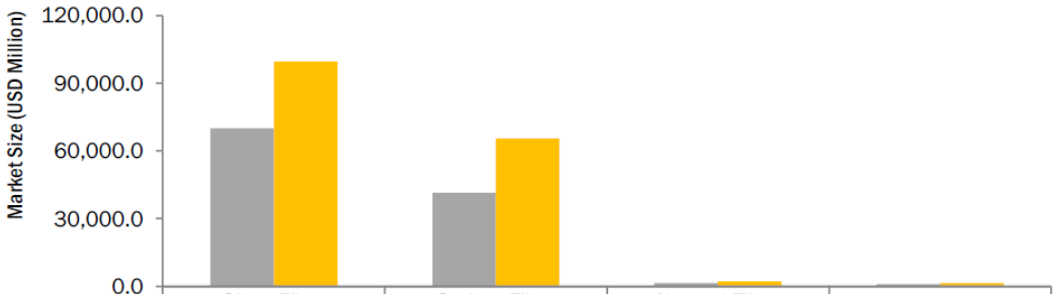
Resin Transfer Molding (RTM) is a vacuum-assisted resin transfer process that uses a flexible solid counter tool for surface compression. This process yields increased laminate compression, a high glass-to-resin ratio, and outstanding strength-to-weight characteristics. It is mainly used to mold components with large surface areas, complex shapes, and smooth finishes. This process is used to produce structures for automotive, construction and infrastructure, and aerospace applications. The growth prospects of the RTM process are high in the next five years due to increasing applications in the automotive and construction industries in emerging countries. It is the most promising technology, as it can yield large, complex three-dimensional components with high mechanical performance, tight dimensional tolerance, and high surface finish.

Other composite manufacturing processes include vacuum bagging and pressure bagging, 3D printing, and continuous laminating. These processes are used to manufacture compact composite layers, sonar domes, antenna housings, and aircraft fairings.

1.4 Market by Fiber Type

Composites are a blend of structural fiber and polymer matrix. The fiber provides structure and strength to composites, while a plastic polymer holds the fiber together. The common **fibers** used in composites include: **glass fiber, carbon fiber, natural fiber and others** (Figure 5). Composites offer various benefits such as non-corrosiveness, non-conductivity, flexibility, low maintenance, durability, and design flexibility.

Figure 5. Composites Market by Fiber Type, in the Period 2022 - 2027



	Glass Fiber Composites	Carbon Fiber Composites	Natural Fiber Composites	Others
2022	69,937.9	41,414.0	1,394.1	915.6
2027	99,451.6	65,493.7	2,184.6	1,428.2
CAGR (2022–2027)	7.7%	9.6%	9.4%	9.3%

Other fiber composites include basalt, aramid fiber, boron fiber, hybrid fiber, and ultra-high-molecular weight polyethylene (UHMWPE) composites

Glass fiber composites are made by mixing glass fibers with a polymer matrix. These fibers are commonly used as a reinforcing element in composites. Owing to superior attributes, such as strength, flexibility, durability, stability, low weight, and resistance to heat, temperature, and moisture, glass fibers are used in the construction, wind energy, pipes and tanks, marine, and transportation industries. Applications include underbody systems, deck lids, front-end modules, bumper beams, engine covers, instrument panels, and air ducts in the transportation industry. The demand for renewable energy in wind turbines, lightweight fuel-efficient aircraft and cars, and GFRP pipes, tanks, and other corrosion-resistant equipment led to high demand for glass fiber composites.

Carbon fiber-reinforced composites are made of carbon fibers and matrix resins. They are lightweight and strong and are used in applications ranging from aerospace to general industrial parts and sports equipment. These composites are used in the form of prepregs, fabrics, pultrusion, and windings. Carbon fiber is increasingly used as the reinforcement for plastic matrices, as these composites have the most weight reduction potential and higher stiffness than glass fiber-reinforced composites. Carbon fiber is twice as strong and 30% lighter than glass fiber and used in several end-use industries. In the automotive industry, carbon fiber-reinforced composites were first used in racing cars to reduce the vehicle's weight and is essential as a high-strength high-rigidity material for the monocoque frame to ensure the driver's safety. In F1 racing cars, carbon fiber-reinforced composites are used for all structural components.

Natural fibers, such as flax, hemp, jute, and kenaf, along with a polymer matrix, such as polypropylene, epoxy, polyethylene, or polyesters, form natural fiber composites. The use of natural fiber composites is growing as an alternative to glass fiber composites in many end-use industries, such as automotive parts, building structures, and consumer goods. Natural fiber reinforcements are mostly used in interior applications of vehicles. These fibers are widely used in automotive applications as they are renewable sources and have lower environmental footprints than carbon or glass fibers.

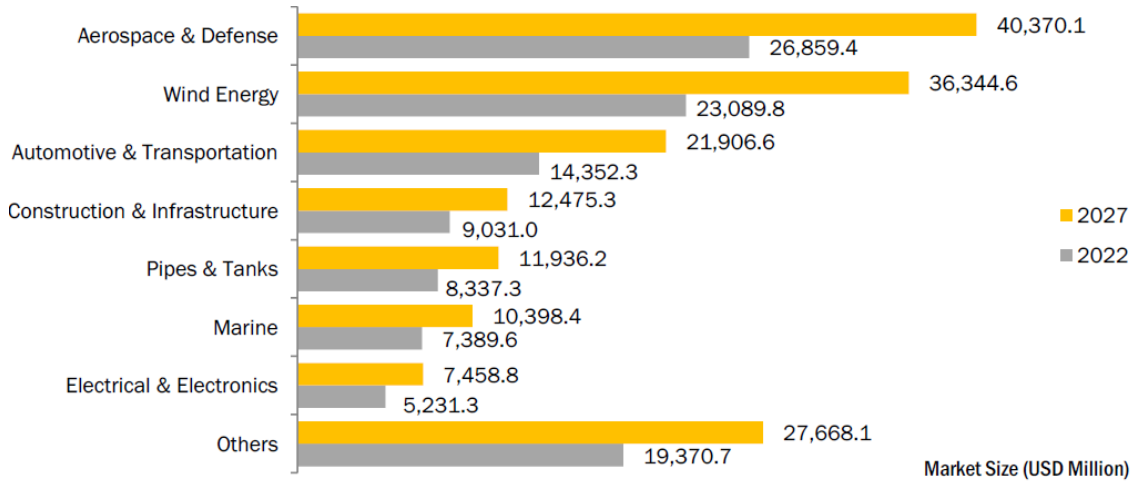
1.5 Market by End-Use Industry

Composites are used in **aerospace & defense, automotive & transportation, pipes & tanks, marine, electrical & electronics, wind energy installation and other end-use industries** (sporting goods, industrial and healthcare) (Figure 6). This demand is attributed to several properties of composites, such as molded surface finish, low weight, high mechanical strength, and insulation against heat transfer and electricity.

The **automotive & transportation industry** is expected to register a significant CAGR during the forecast period and accounts for the largest market share in terms of volume. The ability of the composites to reduce weight and increase fuel efficiency are the major driving factors and comply with the environmental regulations stipulated in North America and Europe. Increasing focus on electric vehicles, decreasing costs of carbon fibers, and increasing penetration of natural fiber composites in the automotive industry are also expected to boost the composites demand in the automotive & transportation industry. Due to COVID-19, the public's sentiments to travel in private cars have also increased for safety reasons. This factor would also drive the demand for composites in the automotive & transportation industry.

The **wind energy sector** accounts for the second-largest share of the overall composites market in terms of volume. Glass fiber composites have a high demand for wind turbine blades, nacelle, and hubs. Composites are also extensively used in the construction & infrastructure industry due to their durability, resulting in reduced maintenance and replacement costs. China and North America are the leading consumers of composites in the construction sector due to huge construction activities being undertaken in these regions. The supply chain restoration after the lockdown across international and national borders and the operation of OEMS at their full production capacities have restored the composites demand and are expected to boost the demand during the forecast period.

Figure 6. Composites Market by End – Use Industry, in the Period 2022 - 2027



Wind Energy

Wind turbine blades are the key components in wind power generation systems. Fiber-reinforced composites are widely used in the development of large-scale wind turbines. The volume of fiber reinforcement used in the wind blades accounts for about 70–75% by weight infused with epoxy or unsaturated polymer resins. Fiberglass also provides high tensile strength, helping manufacturers to achieve larger blades and higher energy output. Fiberglass has helped the wind energy industry grow by allowing wind turbines to work in the toughest environments due to its corrosion resistance properties. The following table gives a roughly estimated breakdown of glass fiber, carbon fiber, thermoset resin, and core materials used in blade manufacturing.

The R&D focus of blade manufacturers has been on increasing the blade length without increasing the cost. Manufacturers use carbon fibers that give higher stiffness, lower density, and lighter blades. Various companies are investing in composites for manufacturing wind blades and other parts for wind turbines. Vestas (Denmark), Goldwind (China), Seimens Gamesa (Spain), GE Renewable Energy (US), Envision Energy (China) and Enercon (Germany) are some of the major players in the wind composites market.

Marine

Glass fiber composites are widely used in the **marine** industry due to their unique properties. The major benefits of using glass fiber composites in boat construction include the ability to mold them to almost any boat design or size, high strength and durability, minimum maintenance, and freedom from corrosion and waterlogging. The use of composite materials reduces weight, meaning more equipment can be installed above the waterline without compromising roll stability. Advanced composites, such as carbon, epoxy, and polyurethane foams, are used to make hulls, keels, decks, transverse frames, and rigs in new yachts and catamarans.

The boats powered by the engine are termed **powerboats or motorboats**. All types of powerboats (including inboard, outboard, and stern drive) are covered in the study. Based on the propulsion system location, there are generally three types of powerboats: inboard, outboard, and sterndrive. Yachts, catamarans, and racing boats are powerboats.

In yachts, composites are used in deck fittings, rudders, hulls, swim ladders, and masts. Carbon fiber-based composites are mostly used for making masts, rudder stock components, or entire boats. More than 90% of yachts are made of glass fiber-based composites. Some of the major yachts builders include Amels (Netherlands), Sunseeker (UK), Princess Yachts (UK), Christensen Shipyards (US), Chaparral Boats (US), Sea Ray (US), and Carver Yachts (US). In catamarans, composites are mainly used to construct superstructures, hulls, and decks. Some of the major catamaran manufacturers are Aquila (US), Catana Catamarans (France), Fountaine Pajot (France), Beneteau (France), Robertson and Caine (South Africa), and Seawind (Australia).

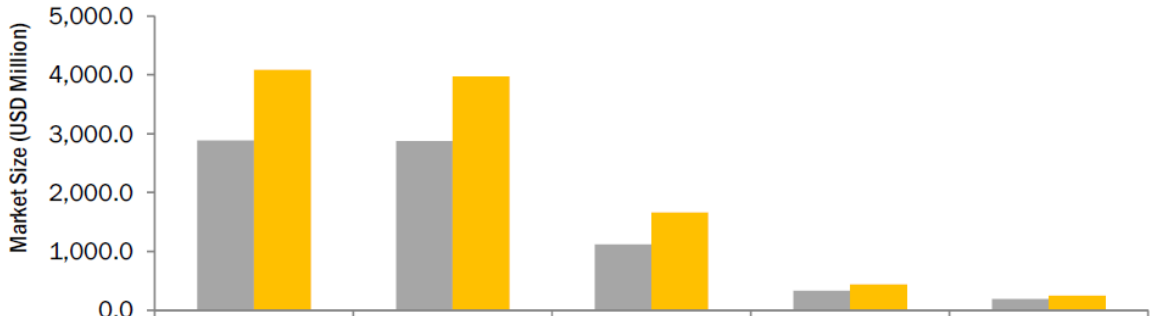
Powered by wind, the **sailboat** is propelled partly or entirely by sails. When tacking, the sails act as the boat's engine, harnessing wind power. The common parts of sailboats include a hull, tiller, rudder, mainsail, mast, boom, jib, and keel. Composites are used extensively in the hulls of sailboats to make them strong and lightweight. Several sailboats, such as cutters, catboats, dinghies, ketch, sloops, and yawls, are used for yachting, where composites are widely used.

A **cruise ship** or a cruise liner is a passenger ship used for pleasure voyages. Europe has a high demand for composites in the cruise ship segment. Some of the biggest cruise ship companies include Meyer Werft (Germany), STX Europe and Fincantieri (Italy), Carnival Corporation & PLC (US), Royal Caribbean Cruises Ltd (US), and The Walt Disney Company (US).

Others include jet boards, rigid inflatable boats (RIB), cargo vessels, and naval ships. Composites are used extensively in patrol boats, corvettes, and warships in the navy and coast guards. They are also used in MARK V Special Operations Craft (SOC) petrol boats by the US Navy in waterjet tunnels, outer skin reinforcements, and hulls. Superstructures, decks, bulkheads, advanced mast systems, propellers, propulsion shafts, rudders, pipes, pumps, and valves of warships and corvettes are important applications. Composites are also used in minesweeper vessels due to their non-magnetic properties.

The **composites market in marine end-use industry by region** is reported in the following figure. The rising expenses of people toward leisure, coupled with the increasing number of HNWI (high net worth individuals), shifted manufacturers' focus on composites in the marine industry, demand for powerboats and sailboats are driving the market.

Figure 7. Composites Market in Marine End-Use Industry by Region, in the Period 2022 - 2027



	Europe	North America	Asia Pacific	Middle East & Africa	South America
2022	2,884.4	2,872.2	1,113.7	329.1	189.8
2027	4,084.0	3,972.2	1,659.2	438.4	244.6
CAGR (2022–2027)	7.2%	6.7%	8.3%	5.9%	5.2%

1.6 Market by Region

The composites market has been segmented into the following regions: **Asia Pacific** (APAC), **North America, Europe, Middle East & Africa and South America** (Table 2). **Europe** dominated the global composites market in 2022 and is projected to register a CAGR of 8.3% between 2022 and 2027. Asia Pacific was the second-largest market for composites in terms of volume in 2022, due to major carbon and glass fiber manufacturers in China and Japan and the emerging economies of China and India. The market in the wind energy sector, which is a prominent user of composites, is growing significantly in the region.

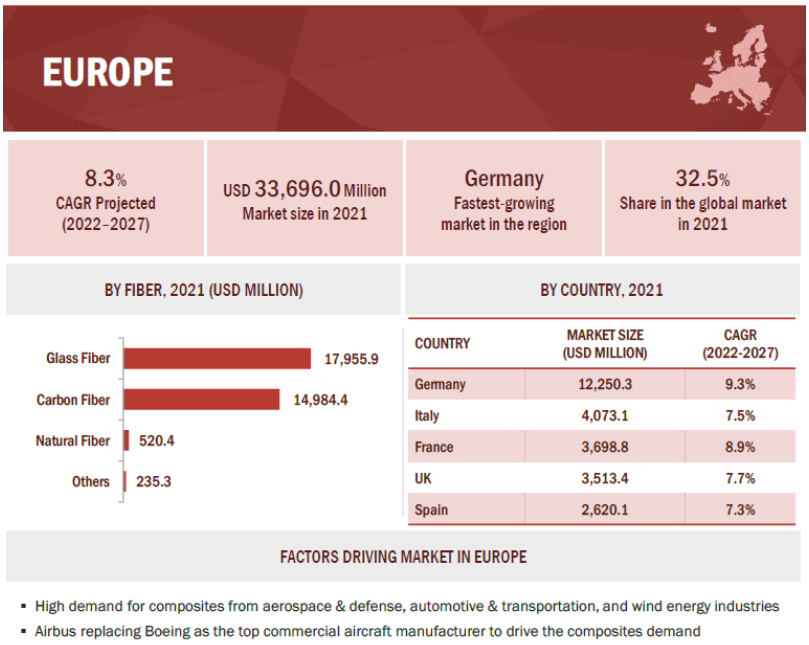
Table 2. Composites Market, by Region, 2022–2027 (USD Million)

Region	2022	2023	2024	2025	2026	2027	CAGR (2022–2027)
Asia Pacific	36,536.1	39,843.6	43,425.6	47,303.2	51,498.8	56,036.7	8.9%
Europe	36,688.8	39,732.5	43,038.0	46,628.4	50,529.2	54,768.1	8.3%
North America	32,770.1	35,241.3	37,907.7	40,785.4	43,891.9	47,246.1	7.6%
Middle East & Africa	5,545.6	5,903.2	6,284.2	6,690.2	7,122.9	7,584.1	6.5%
South America	2,121.0	2,261.2	2,410.8	2,570.6	2,741.1	2,923.1	6.6%
Total	1,13,661.5	1,22,981.8	1,33,066.3	1,43,977.7	1,55,783.9	1,68,558.2	8.2%

1.6.1 Focus on Europe

Europe market segment is projected to register a CAGR of 8.3% between 2022 and 2027 (Figure 8). The demand from the aerospace, transportation, and wind energy industries mainly drives the composites market in Europe. Germany is the leader in the use of natural fiber composites. Renowned German companies, such as Mercedes-Benz, Audi, and BMW, mostly use natural fiber composites for upholstery applications.

Figure 8. Europe: Composites Market Snapshot



Being the largest market by value, Europe is actively involved in many projects, contributing to the market's growth. **Fibreship** (European research project) is constructing light commercial vessels, passenger vessels, and oceanographic vessels more than 50 meters in length. These vessels are being constructed using fiber-reinforced polymer (FRP) composite materials. This project is one of the largest innovative projects funded by the European Union (EU) with a budget of USD 12.5 million, out of which USD 10.2 million is funded by the EU's Horizon 2020 Program.

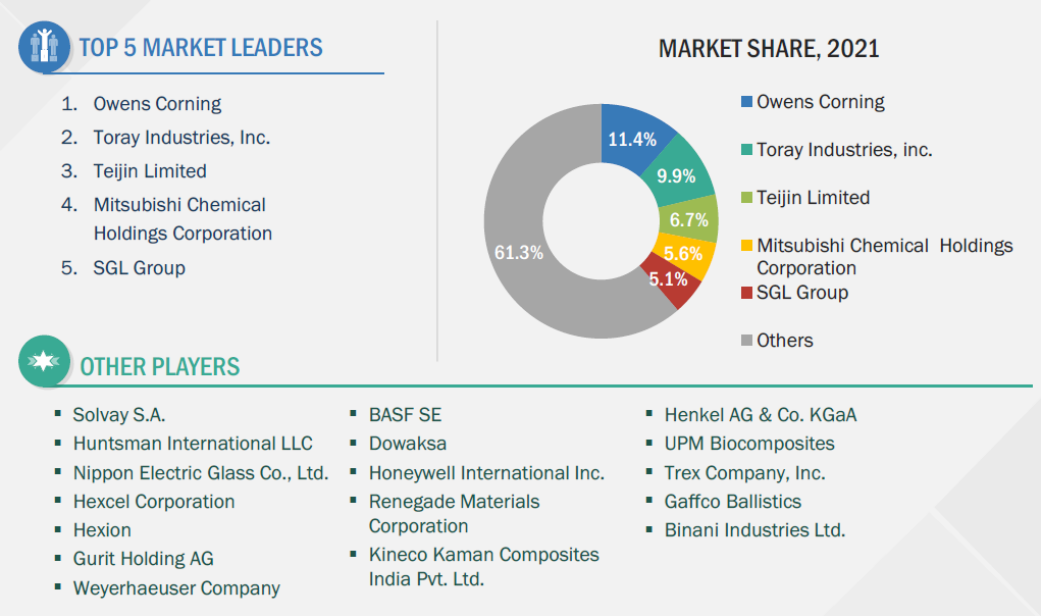
Italy is a significant composites market in Europe. The country has a diversified industrial base, mainly driven by the manufacturing of high-quality. Automotive, marine, wind energy, aerospace, and construction are among the leading end-use industries of composites in Italy.

1.7 Competitive Landscape

Some **key players** in the composites market are: Owens Corning (US), Toray Industries, Inc. (Japan), Teijin Limited (Japan), Mitsubishi Chemical Holdings Corporation (Japan), Hexcel Corporation (US), SGL Group (Germany), Nippon Electric Glass Co. Ltd. (Japan), Huntsman International LLC. (US) and Solvay (Belgium).

The global composites market is dominated by the **top players Owens Corning** (US), **Toray Industries** (Japan), **Teijin Limited** (Japan), **Mitsubishi Chemical Holdings Corporation** (Japan) and **SGL Group** (Germany) (Figure 9). It has been found from the primary and secondary analysis that these top companies accounted for a total 38.7% share of the global composites market. The remaining companies account for a 61.3% share of the market.

Figure 9. Market Share of Top Companies in Composites Market



Mitsubishi Chemical Holdings Corporation manages its composites business through its subsidiary Mitsubishi Chemical Corporation. The Carbon Fiber & Composites Material under Performance Material business segment offers carbon fiber tow, prepregs, and fabricated composite products. The company's carbon fiber products have applications in the automotive and sports industries.

Owens Corning is an American multinational corporation headquartered in Toledo, Ohio, US. It manufactures a broad range of roofing, insulation, and fiberglass composite materials. Owens Corning products are used in various applications such as sports goods, consumer electronics, **boats**, aircraft, defense, **wind energy**, construction, roofing, and pipes. It offers composites as a product of its Fiberglass Composites business. The company primarily offers residential and commercial building materials, glass-fiber reinforcements, and engineered materials for composite systems.

Solvay S.A. is one of the leading companies involved in plastic and chemical businesses worldwide. The company develops, manufactures, and markets its products to various industries including agriculture, feed & food, automotive & aerospace, building & construction, customer goods & healthcare, electrical & electronic, and industrial.

Teijin Limited is a Japanese chemical, pharmaceutical, and information technology company involved in the manufacture, processing, and selling of chemical products. Its main fields of operations are high-performance fibers such as aramid, carbon fibers & composites, healthcare, films, resin & plastic processing, polyester fibers, product converting, and IT products. The company offers advanced solutions having applications in the transportation, electronics, energy, and healthcare sectors.

Toray Industries is a multinational corporation specializing in industrial products involving core technologies in organic synthetic chemistry, polymer chemistry, and biochemistry. The company, currently, is the largest producer of carbon fiber in the world and synthetic fiber in Japan. Toray Industries, Inc.'s subsidiary, Zoltek Composites, Inc. (US) offers carbon composites for the automotive, **maritime**, commercial, and mobility industries.

Other companies involved in the **marine applications** are the following: **Gurit Holding AG** (Switzerland), engaged in developing and producing composite materials for various industries including wind energy, transportation, **marine**, sports, and civil engineering and **Hexicon** (USA). Hexion offers various specialty epoxy resins for composites used in **boat**

building, sports goods, civil construction and industrial applications. It provides technically advanced, high-performance, and cost-efficient thermosets to design and produce lighter, carbon- and glass fiber-reinforced composite structures for the boats, construction, wind energy, and industrial applications.

2 Conclusions

Composites are used in various end-use industries, including **wind energy** and **marine**. Various fibers (glass, carbon, natural, and others) and polymer matrix (**thermoset** and **thermoplastic**) are used in composites depending on applications and on the required specifications. Led by strong end-user demand, the composites market is growing rapidly.

In terms of value, the global **composites market** is projected to register a CAGR of 8.2% between 2022 and 2027 and a value of USD 168.6 billion by 2027.

The **thermoset composites segment** dominated the global composites market in 2021 in terms of volume and value. Thermoset composites are widely used in transportation, aerospace & defense, marine, electrical & electronics, and wind energy industries. Thermoset composites are durable, low on maintenance, cost-effective and have high-performance properties.

The **thermoplastic** composites market is projected to grow significantly in terms of value and volume during the forecast period 2022 – 2027 due to high demand from interior applications in the aerospace and defense and automotive and transportation industries. Thermoplastics can be reshaped and reformed, unlike thermoset resins, and thus, their market penetration is expected to increase during the forecast period.

Glass fiber composites are widely used in the **marine** industry due to their unique properties. The use of composite materials reduces weight, meaning more equipment can be installed above the waterline without compromising roll stability. **Europe** is expected to be largest market segment in marine end-use industry in the coming years.

3 Sources

MarketsandMarkets Knowledge Store - Multisectoral database that collects market research reports in various technological fields and designed to process some information interactively. More than 1,200 market reports are published each year (https://www.mnmks.com/)[1]. The information provided have been extracted by the report: "*Composites Market – Global Forecast to 2027*", November 2022.

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