

Ceramic Matrix Composites Market by Matrix Type (C/C, C/Sic, Oxide/Oxide, Sic/Sic), Fiber Type (Continuous, Woven), End-use Industry (Aerospace and Defense, Automotive, Energy and Power, Industrial), and Region - Global Forecasts to 2028

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Abstracts

The ceramic matrix composites market is projected to grow from USD 11.9 billion in 2022 to USD 21.6 billion by 2028, at a CAGR of 10.5% during the forecast period. Carbon/SiC ceramic matrix composites offer a unique combination of high-temperature resistance, lightweight design, and excellent mechanical properties. These properties make them highly desirable for demanding applications in aerospace, automotive, semiconductor, energy, and industrial sectors, where performance, durability, and efficiency are crucial factors. Carbon/SiC CMCs are utilized in various industrial sectors that require high-temperature resistance, chemical inertness, and lightweight design. Examples include heat exchangers, metal refining, chemical processing equipment, and high-temperature manufacturing processes. Ongoing research and development efforts continue to enhance the properties and expand the range of applications for Carbon/SiC ceramic matrix composites.

“In terms of value, Aerospace & defense end-use industry accounted for the largest share of the overall ceramic matrix composites market”

Aerospace & defense is the largest end-use industry of ceramic matrix composites market. These composites are used in the aerospace & defense industry owing to their properties such as high damage tolerance, fracture toughness, and high temperature, wear, & corrosion resistance. The increased demand for ceramic matrix composites for commercial aerospace gas turbine engines, nose caps, exhaust nozzles, and missile propulsion systems is driving the growth of the market in the aerospace & defense

industry. ceramic matrix composites are being explored for use in various engine components, including pistons, cylinder liners, and valves. These components require high-temperature resistance and wear resistance. ceramic matrix composites can withstand the high temperatures generated by combustion processes and offer reduced friction, contributing to improved engine efficiency and durability.

““In terms of value, Continuous fiber type segment expected to register second highest CAGR during the forecast period”

Based on fiber type, the Continuous fiber type segment is expected to register the second highest CAGR during the forecast period for the ceramic matrix composites market. Continuous fibers are a type of ceramic matrix composites where long continuous fibers are embedded in a ceramic matrix. These fibers run uninterrupted through the entire length or area of the composite, providing continuous reinforcement. The continuous fiber architecture offers several advantages, including enhanced strength, stiffness, and toughness. Continuous ceramic matrix composites exhibit excellent load-bearing capabilities, high thermal stability, and resistance to environmental degradation. These composites are commonly used in high-performance applications, such as aerospace, where their combination of lightweight design and superior mechanical properties can significantly improve performance and fuel efficiency. Continuous ceramic matrix composites are utilized in components such as engine parts, structural elements, and thermal protection systems, contributing to the advancement of high-temperature materials and technologies in various industries.

“During the forecast period, the fiberglass market in North America region is projected to register the highest market share”

The ceramic matrix composites market has been studied in North America, Europe, Asia Pacific, the Middle East, Africa, and Latin America. North America accounted for the largest market share in 2022, whereas Europe accounted for the second-largest market share in 2022, followed by Asia Pacific. The North American market will experience considerable growth in the upcoming years. ceramic matrix composites has significant potential in defense applications in North America. They are being explored for their use in armor systems, ballistic protection, blast-resistant structures, and other defense-related components. The lightweight and high-strength properties of ceramic matrix composites make them desirable for enhancing the performance and survivability of military equipment.

This study has been validated through primary interviews with industry experts globally.

These primary sources have been divided into the following three categories:

By Company Type- Tier 1- 35%, Tier 2- 25%, and Tier 3- 40%

By Designation- C Level- 35%, Director Level- 30%, and Others- 35%

By Region- North America- 20%, Europe- 25%, Asia Pacific - 25%, South America- 10%, Middle East & Africa (MEA)- 20%

The report provides a comprehensive analysis of company profiles:

Prominent companies include General Electric (US), Rolls-Royce PLC (UK), SGL Carbon (Germany), Raytheon Technologies Corporation (US), Axiom Materials Inc. (US), CoorsTek (US), Lancer Systems (US), COI Ceramics (US), Applied Thin Films (US), Ultramet (US), CFC Carbon co., ltd. (China), among others.

Research Coverage

Ceramic Matrix Composites Market, Fibre Type (Continuous, Woven, Others), End-use Industry (Aerospace & Defence, Automotive, Energy & Power, Industrial, Others), and Region (North America, Europe, Asia Pacific, the Middle East & Africa, and Latin America). The scope of the study includes thorough information on the important elements impacting the growth of the ceramic matrix composites market, such as drivers, restraints, challenges, and opportunities. A comprehensive review of the top industry participants has been conducted in order to provide insights into their business overview, solutions, and services; important strategies; contracts, partnerships, and agreements. New product and service launches, mergers and acquisitions, and current developments in the ceramic matrix composites sector are all covered. The report includes a competitive study of upcoming startups in the ceramic matrix composites industry ecosystem.

Reasons to buy this report:

The report will help the market leaders/new entrants in this market with information on the closest approximations of the revenue numbers for the overall ceramic matrix composites and the subsegments. This report will help stakeholders understand the competitive landscape and gain more insights to position their businesses better and to plan suitable go-to-market strategies. The report also helps stakeholders understand

the pulse of the market and provides them with information on key market drivers, restraints, challenges, and opportunities.

The report provides insights on the following pointers:

Analysis of key drivers (Growing demand for ceramic matrix composites in developing countries, Higher demand for lightweight, fuel-efficient vehicles), restraints (Higher costs compared to other metals and alloys, Limitations of ceramic matrix composites in various applications), opportunities (Higher usage of lightweight components, Mass manufacture and standardization of ceramic matrix composites production process), and challenges (Limited usage due to reparability and recyclability, Scaling up the manufacturing process while maintaining consistent quality and reducing costs) influencing the growth of the ceramic matrix composites market

Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product & service launches in the ceramic matrix composites market

Market Development: Comprehensive information about lucrative markets – the report analyses the ceramic matrix composites market across varied regions

Market Diversification: Exhaustive information about new products & services, untapped geographies, recent developments, and investments in the ceramic matrix composites market

Competitive Assessment: In-depth assessment of market shares, growth strategies and service offerings of leading players like General Electric (US), Rolls-Royce PLC (UK), SGL Carbon (Germany), Raytheon Technologies Corporation (US), Axiom Materials Inc. (US), CoorsTek (US), Lancer Systems (US), COI Ceramics (US), Applied Thin Films (US), Ultramet (US), CFC Carbon co., Ltd. (China), among others in the ceramic matrix composites market

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*Details on Business Overview, Products Offered, Recent Developments, MnM View, Right to win, Strategic choices made, Weaknesses and competitive threats might not be captured in case of unlisted companies.

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About

The ceramic matrix composites market is broadly segmented on the basis of raw materials used in the manufacturing process; these segments are oxide/oxide composites, silicon carbide/silicon carbide composites, carbon/carbon composites, and others. On the basis of end-use applications, the ceramic matrix composites market is segmented in five segments, these are aerospace, defense, energy & power, electrical & electronics, and others. The global ceramic matrix composites market is witnessing a high growth owing to the rapidly growing; aerospace, defense, and energy & power industries. The increasing demand for light-weight as well as heat and wear & tear resistant components in these industries is providing lucrative opportunities to the market players.

In terms of value, the global ceramic matrix composites market size was estimated to be \$XX million in 2013 and is projected to reach \$XX million by 2019, registering a CAGR of XX% between 2014 and 2019. North America is the leading market for ceramic matrix composites, globally. The market size in North America was estimated to be \$XX million in 2013 and is projected to reach \$XX million by 2019, registering a CAGR of XX% during the projected period. Europe and Asia-Pacific constitute the second- and third-largest markets for ceramic matrix composites. Asia-Pacific is the fastest-growing market for ceramic matrix composites, globally. Owing to the rapid growth in the aerospace, defense, energy & power, and automotive industries in Asia-Pacific, this region is becoming a key market for ceramic matrix composite manufacturers. In terms of value, the market for ceramic matrix composites in Asia-Pacific was estimated to be \$XX million in 2013 and is projected to reach \$XX million by 2019, at a CAGR of XX% during the forecast period.

The global ceramic matrix composites market is vibrant, owing to the rapidly growing aerospace, defense, and energy & power industries throughout the world. North America and Asia-Pacific are the key markets for ceramic matrix composites manufacturers as these are the fastest-growing markets pertaining to their consumption. North America accounted for a share of around XX% of the global ceramic matrix composites market size, in terms of value, in 2013; while the market in Asia-Pacific accounted for around XX%.

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