

# Silicon Carbide Market Poised for Explosive Growth Driven by Power Electronics and Industrial Applications

*silicon carbide (SiC) market is experiencing a surge in demand, driven by its superior properties for power electronics*

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/EINPresswire.com/ -- The global [silicon carbide \(SiC\) market](#) is experiencing a surge in demand, driven by its superior properties for power electronics and industrial applications. According to Emergen Research, the market is estimated to be worth USD 3.10 billion in 2022 and is projected to reach a staggering USD 9.18 billion by 2032, reflecting a compound annual growth rate (CAGR) of 11.6%.



## Market Overview

Silicon carbide is a wide bandgap semiconductor material known for its exceptional characteristics, including high thermal conductivity, high-temperature resistance, and superior switching efficiency. These properties make it a compelling alternative to traditional silicon (Si) in various applications, particularly in power electronics.

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## Key Trends and Drivers

The primary driver of the SiC market is the burgeoning demand for power electronics. SiC devices offer significant advantages over Si counterparts, including:

Reduced energy consumption: SiC enables higher efficiency in power conversion, leading to

lower energy losses and operational costs.

Increased power density: SiC devices can operate at higher temperatures, allowing for more compact and lighter designs.

Improved performance: SiC facilitates faster switching speeds, enabling better system performance and reduced electromagnetic interference (EMI).

Beyond power electronics, SiC is gaining traction in other industrial applications, including:

Electric vehicles (EVs): SiC components enhance the efficiency and range of EVs by reducing energy losses in inverters and on-board chargers.

Aerospace and defense: SiC's high-temperature capabilities make it ideal for harsh environments in aircraft and military systems.

Industrial automation: SiC components improve the reliability and efficiency of industrial motors and drives.

## Restraints and Challenges

While the future of SiC appears bright, some challenges remain:

High initial cost: Currently, SiC substrates are more expensive to produce compared to Si, impacting overall device cost.

Limited wafer size: The availability of large-diameter SiC wafers is still limited, hindering the scalability of SiC devices.

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## Growth Opportunities

Technological advancements are expected to address these challenges and unlock further growth opportunities:

Continued advancements in SiC substrate manufacturing: As production processes become more efficient, the cost of SiC is anticipated to decline.

Development of larger-diameter SiC wafers: Increased availability of larger wafers will enable the production of more powerful and cost-effective SiC devices.

Government initiatives promoting energy efficiency: Public policies encouraging the adoption of energy-saving technologies will further propel the SiC market.

## SWOT Analysis

### Strengths:

Superior performance characteristics of SiC compared to Si

Growing demand for energy efficiency and power density

Expanding application areas beyond power electronics

### Weaknesses:

High initial cost of SiC devices

Limited availability of large-diameter SiC wafers

Relatively nascent market compared to Si

### Opportunities:

Technological advancements reducing SiC production costs

Increasing adoption of SiC in EVs, aerospace, and industrial applications

Government support for energy-efficient technologies

### Threats:

Fluctuations in raw material prices

Potential emergence of alternative wide bandgap semiconductor materials

## Strategic Developments and M&A Activity

On June 19, 2023, Vitesco Technologies, a manufacturer of cutting-edge drive technologies and electrification solutions, acquired strategically important production capacity of energy-efficient silicon carbide power semiconductors through a long-term supply partnership with ROHM. The development partnership with manufacturer ROHM, which began in 2020, laid the foundation for the delivery partnership currently concluded in Regensburg. Vitesco Technologies' advanced inverters, which integrate Rohm SiC chips, have been adopted and used in electric vehicle

powertrains. Vitesco Technologies plans to start delivering its first series of projects as early as 2024.

## Silicon Carbide Top Companies and Competitive Landscape

The global silicon carbide market is fragmented, with large and medium-sized players accounting for the majority of market revenue. Major players are deploying various strategies, entering into mergers & acquisitions, strategic agreements & contracts, developing, testing, and introducing more effective silicon carbide.

Some of the major companies included in the global silicon carbide market report are:

ADSCO Corp.

CUMI

IMERYS S.A.

Coorstek Inc.

Enterrgris Inc.

ESD SIC b.v.

Gaddis Enginnered Materials

Grindwell Norton Ltd.

Norstel AB

Snam Abrasives Pvt. Ltd.

Reneas Electronics Corporation

ROHM Co. Ltd

Microsemi

Toshiba Corporation

Infineon Technologies

Fuji Electric Co. Ltd.

Soliton Devices Inc.

Coherent Corp.

Sk Siltron Co. Ltd

Tokai Carbon Co. Ltd

## Silicon Carbide Market Segment Analysis

For the purpose of this report, Emergen Research has segmented the global silicon carbide market on the basis of type, wafer size, application, end-use, and region:

Type Outlook (Revenue, USD Billion, Volume, Kilotons; 2019-2032)

Black Silicon Carbide

Green Silicon Carbide

Wafer Size Outlook (Revenue, USD Billion, Volume, Kilotons; 2019-2032)

Up to 150 MM

> 150 MM

Application Outlook (Revenue, USD Billion, Volume, Kilotons; 2019-2032)

Energy and vehicles

Transportation

Consumer Appliances

Medicines

Led Lights and Transistors

Others

End-Use Outlook (Revenue, USD Billion, Volume, Kilotons; 2019-2032)

Automotives

Aerospace and aviation

Military and Defense

Electronics and Semi-Conductors

Medical and Healthcare

Others

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