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Global Ceramics for Semiconductor Market Growth (Status and Outlook) 2026-2032

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Abstracts

The global Ceramics for Semiconductor market size is predicted to grow from US$ 3339 million in 2025 to US$ 5505 million in 2032; it is expected to grow at a CAGR of 7.4% from 2026 to 2032.

Ceramic materials for semiconductors mainly refer to various ceramic components used in semiconductor equipment.

Advanced engineering ceramic and quartz (fused silica) components and their coating systems are adopted to meet the requirements of high purity and cleanliness, corrosion/plasma resistance, resistance to high-temperature thermal cycling, dimensional stability, electrical insulation/thermal management, etc. Typical applications include: liners and ring components for plasma etching/deposition chambers, spray/gas distribution/insulation components, lift pins/clamping and handling components, support and guide components under vacuum conditions, as well as functional components such as ceramic heating/temperature control units and electrostatic chucks (ESCs).

In terms of material systems, ceramics for semiconductor equipment are mainly composed of high-purity oxide ceramics (Al?O?, Y?O?, ZrO?/ZTA, etc.) and non-oxide ceramics (AlN, SiC, Si?N?, BN/PBN, etc.). Their engineering-scale delivery is realized through the process chain of 'high-purity powder preparation ? shaping ? sintering/hot pressing/CVD ? precision machining ? ultra-clean cleaning ? (optional) coating/reconditioning'. On the trend front, on one hand, advanced process nodes and harsher plasma environments are accelerating the application of materials and coatings with higher corrosion resistance and lower particle generation (such as Y?O?/YOF systems and densified coating processes). On the other hand, in thermal management and high-temperature processes, high thermal conductivity ceramic components for

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heating and bearing (such as AlN-based parts) are continuously increasing their market penetration.

Given the locations and importance of ceramic components in semiconductor equipment, their industrialization in the semiconductor field must meet stringent requirements in the following three aspects:

1. Advanced ceramic material performance: The materials must satisfy the comprehensive performance requirements of semiconductor equipment in terms of mechanical properties, thermal characteristics, dielectric properties, acid and alkali resistance, and plasma corrosion resistance.

2. Precision machining of hard and brittle difficult-to-machine materials: Advanced ceramic materials fall into the category of hard and brittle difficult-to-machine materials. Semiconductor equipment imposes high precision requirements on components, making machining one of the persistent bottlenecks restricting the application of ceramic components in semiconductor equipment.

3. Surface treatment of finished components: Since ceramic components in semiconductor equipment are usually closely arranged around wafers, and some even come into direct contact with wafers, the control of surface metal ions and particles is extremely strict. Post-machining surface treatment is therefore one of the key technologies for the application of ceramic components in semiconductor equipment.

The current status of the global market for ceramic components used in semiconductors can be summarized as small in scale yet highly critical, and strongly correlated with wafer fab capital expenditures and process complexity. These components are typically embedded as consumables, wear parts, or key functional components in the core chambers and transfer systems of front-end equipment (e.g., liners and ring components for plasma etching/deposition chambers, load-bearing, thermal insulation and electrical insulation parts, structural components for vacuum/chemical environments, etc.). Their demand is driven by two core factors: first, the cyclicality of wafer fab expansion and equipment investment; second, the increase in unit value and replacement frequency brought about by process upgrades. Taking 300mm wafer fabs as an example, SEMI forecasts that equipment spending for 300mm fabs will exceed USD 100 billion in 2025, with a cumulative expenditure of approximately USD 374 billion from 2026 to 2028. This directly boosts the demand for high-purity, plasma-resistant, low-particle ceramic structural components driven by both equipment installation volume and in-service maintenance needs on the equipment side.

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In terms of key applications and competitive landscape, the most demanding use cases are concentrated in critical front-end equipment, including vacuum/insulation structural components for etching, various thin-film deposition, ion implantation, thermal processing/diffusion, and certain lithography-related processes, as well as high-purity wafer handling and load-bearing components. The industry is characterized by customized design, long validation cycles, and strong customer binding. In terms of competition, the global market has long been dominated by a small number of technical ceramics manufacturers with comprehensive capabilities in material systems, precision machining, and global delivery. Typical players include NGK Insulators, Kyocera, Niterra Co., Ltd., Coorstek, Ferrotec, TOTO Advanced Ceramics, Morgan Advanced Materials, and MiCo Ceramics Co., Ltd. In 2024, the top 8 global manufacturers accounted for 83% of the total market share. These companies provide customized products and process capabilities for semiconductor processing equipment, ranging from chamber liners/ring components to process chambers and various ceramic assemblies. For instance, Morgan publicly states that its semiconductor ceramic components cover applications such as Lithography, Implant, and CVD/PVD/Etch; NGK lists products including ceramic heaters, electrostatic chucks (ESCs), and chamber components made of AlN/Al?O?. In recent years, these manufacturers have expanded their capacities to meet growing demand?NGK, for example, has announced production expansion to cater to product requirements related to the next-generation semiconductor market. Overall, future industry differentiation will be primarily reflected in four core 'hard indicators': (1) plasma-resistant material systems and coating technologies; (2) ultra-high purity and low-particle control; (3) mass production of complex-shaped components with high consistency; (4) global local supply and rapid response capabilities.

From the perspective of growth trends and driving factors, the global market for semiconductor ceramic components is likely to exhibit steady growth alongside rising 300mm fab investment in the coming years, with simultaneous increases in unit value and consumption intensity. On one hand, in its latest 300mm Fab Outlook, SEMI predicts that global equipment spending for 300mm fabs will surpass USD 100 billion for the first time in 2025 (reaching approximately USD 107 billion), with cumulative spending hitting USD 374 billion from 2026 to 2028. The underlying drivers are clearly the surging demand for AI chips and the construction of regional/localized production ecosystems (focused on self-sufficiency and supply chain restructuring). Among these, logic/microprocessing chips (including sub-2nm, GAA, backside power delivery technologies, etc.) and memory chips (including HBM and 3D NAND) are the primary sources of investment and process upgrades. This means that the installation volume

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and utilization rate of critical equipment such as etching, thin-film deposition, thermal processing, cleaning, and ion implantation systems will continue to rise. Ceramic structural components are widely embedded in the core process chambers and key subsystems operating under harsh conditions (high temperature, high vacuum, strong plasma, and strong corrosion), such as chambers for Lithography, Implant, CVD/PVD/Etch applications, thus generating dual demand growth from initial equipment installation (BOM) and in-service maintenance (MRO). On the other hand, advanced processes impose increasingly stringent requirements on particle and metal contamination control, plasma erosion resistance, thermal stability, and thermal shock reliability. This has transformed ceramic structural components from 'general-purpose structural materials' into 'key factors influencing yield and equipment uptime', driving the iteration of material systems toward ultra-high purity alumina, aluminum nitride, silicon carbide, and high-purity sapphire. These materials are also combined with surface engineering technologies (coating, densification, cleaning) to reduce particle and contamination risks. For example, in wafer transfer and end-effector applications, ceramic transfer arms emphasize heat resistance and low wafer damage, with DLC coatings to enhance contamination resistance and anti-diffusion performance; in high-temperature and high-plasma environments, ultra-high purity materials are prioritized to improve plasma tolerance and low-particle characteristics; in chamber thermal management and clamping control systems, typical ceramic functional components such as electrostatic chucks and ceramic heaters highlight wide temperature range compatibility, corrosion resistance, low-particle processing, and temperature uniformity achieved through high thermal conductivity materials (e.g., AlN) to minimize metal contamination.

LPI (LP Information)' newest research report, the ?Ceramics for Semiconductor Industry Forecast? looks at past sales and reviews total world Ceramics for Semiconductor sales in 2025, providing a comprehensive analysis by region and market sector of projected Ceramics for Semiconductor sales for 2026 through 2032. With Ceramics for Semiconductor sales broken down by region, market sector and sub-sector, this report provides a detailed analysis in US$ millions of the world Ceramics for Semiconductor industry.

This Insight Report provides a comprehensive analysis of the global Ceramics for Semiconductor landscape and highlights key trends related to product segmentation, company formation, revenue, and market share, latest development, and M&A activity. This report also analyses the strategies of leading global companies with a focus on Ceramics for Semiconductor portfolios and capabilities, market entry strategies, market positions, and geographic footprints, to better understand these firms? unique position

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in an accelerating global Ceramics for Semiconductor market.

This Insight Report evaluates the key market trends, drivers, and affecting factors shaping the global outlook for Ceramics for Semiconductor and breaks down the forecast by Type, by Application, geography, and market size to highlight emerging pockets of opportunity. With a transparent methodology based on hundreds of bottom-up qualitative and quantitative market inputs, this study forecast offers a highly nuanced view of the current state and future trajectory in the global Ceramics for Semiconductor.

This report presents a comprehensive overview, market shares, and growth opportunities of Ceramics for Semiconductor market by product type, application, key players and key regions and countries.

Segmentation by Type:

Alumina Ceramics

AlN Ceramics

SiC Ceramics

Silicon Nitride Ceramics

Others

Segmentation by Application:

Thin Film Deposition Equipment

Etching Equipment

Lithography Equipment

Ion Implanter

Thermal Processing Equipment

CMP Equipment

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- Wafer Handling Equipment
- Packaging and Testing Equipment
- Other Semiconductor Equipment

This report also splits the market by region:

- Americas
  - United States
  - Canada
  - Mexico
  - Brazil
- APAC
  - China
  - Japan
  - Korea
  - Southeast Asia
  - India
  - Australia
- Europe
  - Germany
  - France

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UK

Italy

Russia

Middle East & Africa

Egypt

South Africa

Israel

Turkey

GCC Countries

The below companies that are profiled have been selected based on inputs gathered from primary experts and analyzing the company's coverage, product portfolio, its market penetration.

NGK Insulators

Kyocera

Ferrotec

TOTO Advanced Ceramics

Niterra Co., Ltd.

ASUZAC Fine Ceramics

Japan Fine Ceramics Co., Ltd. (JFC)

Maruwa

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Nishimura Advanced Ceramics

Repton Co., Ltd.

Pacific Rundum

Coorstek

3M

Bullen Ultrasonics

STC Material Solutions

Precision Ferrites & Ceramics (PFC)

Ortech Ceramics

Morgan Advanced Materials

CeramTec

Saint-Gobain

Schunk Xycarb Technology

Advanced Special Tools (AST)

MiCo Ceramics Co., Ltd.

WONIK QnC

Micro Ceramics Ltd

Suzhou KemaTek, Inc.

Shanghai Companion

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Sanzer (Shanghai) New Materials Technology

St.Cera Co., Ltd

Fountyl

Hebei Sinopack Electronic Technology

ChaoZhou Three-circle

Fujian Huaqing Electronic Material Technology

3X Ceramic Parts Company

Krosaki Harima Corporation

Kallex Company,Ltd

Shaanxi UDC Materials Technology

AGC

Coalition Technology

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