

# Monolithic Ceramics – A Global Market Overview

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## Abstracts

### Global Monolithic Ceramics Market Trends and Outlook

Monolithic Ceramics are high-strength, brittle materials composed of both metallic and non-metallic atoms. These ceramics have a polycrystalline microstructure and can be fabricated without using any reinforcement material. They consist of a weak cell boundary network that deflects cracks and a hexagonal arrangement of submillimeter strong polycrystalline ceramic cells. These materials are usually made of a single phase using a number of techniques, such as hot pressing, sintering and powder compaction. Due to their indispensable characteristics, such as reliability, durability and resistance to high temperatures, they have been adopted as an alternative to traditional metals and plastics.

Based on their attributes, Monolithic Ceramics are classified into oxides and non-oxides. Some examples of oxides are aluminum oxide or alumina ( $Al_2O_3$ ), zirconium oxide or zirconia ( $ZrO_2$ ) and titanium dioxide ( $TiO_2$ ), while non-oxide monolithic ceramics primarily include nitrides [aluminum nitride ( $AlN$ ), boron nitride ( $BN$ ), silicon nitride ( $Si_3N_4$ ) and titanium nitride ( $TiN$ )], carbides [boron carbide ( $B_4C$ ), silicon carbide ( $SiC$ ), titanium carbide ( $TiC$ ) and tungsten carbide ( $WC$ )] and borides [titanium diboride ( $TiB_2$ )]. These ceramics find use in various end-use sectors, such as electrical & electronics, automotive & transportation, aerospace, power generation, defence & military and healthcare.

The global demand for Monolithic Ceramics is estimated at US\$20.2 billion in 2024 and is projected to reach US\$29.2 billion by 2030 at a CAGR of 6.3% between the two years. Demand for Monolithic Ceramics has been exhibiting noteworthy growth over the recent past and is expected to maintain this trend during the analysis period. The major reasons include increasing demand for electronic devices, especially in manufacturing capacitors and transistors for smartphones, laptops, TVs, cameras and IoT equipment,

the growing need in medical care devices and continuous innovations in research & development to enhance the properties of monolithic ceramics. These materials are also extensively used in pollution control devices in automobiles due to the alarming concern over environmental issues. Stringent regulatory guidelines have been enforced by governments in regard to curbing the emissions of greenhouse gases from various sources.

### Monolithic Ceramics Regional Market Analysis

Geographically, Asia-Pacific is anticipated to be the largest and also the fastest growing global market for Monolithic Ceramics, owing to the fact that China and Japan are among the major manufacturers of these ceramics due to their high investment in research & development for developing novel products. Besides, there has been an increased demand from a wide array of end-use industries, including electrical & electronics, healthcare and automotive & transportation, among others. Stringent environmental laws have also been contributory in manufacturing pollution controlling equipment in order to safeguard the environment from harmful emissions and lastly, rapid industrialization along with infrastructural development, have propelled the global market for Monolithic Ceramics.

### Monolithic Ceramics Market Analysis by Type

Based on type, Oxide Monolithic Ceramics are estimated to hold a larger global market share, the major factors for which include extensive use of these materials in making capacitors for the electronics & electrical industry due to their beneficial characteristics, such as small size, light weight, high performance and capacitance, as against traditionally used materials. In addition, they are also used in semiconductors, smart wearable devices and electronic components. However, Non-Oxides are anticipated to maintain a faster growth during the analysis period owing to their wider utilization in the aerospace and automotive industries because of their unique properties, such as temperature and corrosion resistance.

### Monolithic Ceramics Market Analysis by Form

With regard to form, the market for Powdered Monolithic Ceramics is expected to be the largest, as well as fastest growing, owing to their widespread application in making various other forms and sizes, such as discs, plates, rods and insulators, which are further used in different applications.

## Monolithic Ceramics Market Analysis by End-Use Sector

On the basis of end-use sector, Electrical & Electronics is estimated to be the dominating, as also the fastest growing, segment in the global market for Monolithic Ceramics. Their remarkable electrical insulating properties have facilitated their widespread use in this particular sector. Due to rapid technological advancements, these materials have improved to become more enduring to the challenges and are constantly needed to deliver consistent performance. The heat resistance, durability and capability of Monolithic Ceramics to manage high frequencies have made them highly suited to be applicable in a range of latest solutions, such as smart devices, wearables and advanced communication technologies.

## Monolithic Ceramics Market Report Scope

This global report on Monolithic Ceramics analyzes the global and regional markets based on type, form and end-use sector for the period 2021-2030 with projections from 2024 to 2030 in terms of value in US\$. In addition to providing profiles of major companies operating in this space, the latest corporate and industrial developments have been covered to offer a clear panorama of how and where the market is progressing.

## Key Metrics

Historical Period: 2021-2023

Base Year: 2024

Forecast Period: 2024-2030

Units: Value market in US\$

Companies Mentioned: 40+

## Monolithic Ceramics Market by Geographic Region

North America (The United States, Canada and Mexico)

Europe (France, Germany, Italy, Russia, Spain, The United Kingdom and Rest of Europe)

Asia-Pacific (China, Japan, India, South Korea and Rest of Asia-Pacific)

South America (Argentina, Brazil and Rest of South America)

Middle East & Africa

## Monolithic Ceramics Market by Type

Non-Oxide

Borides

Carbides

Nitrides

Oxide

Aluminum Oxide

Titanium Dioxide

Zirconium Oxide

## Monolithic Ceramics Market Analysis by Form

Disc

Insulator

Plate

Powder

Rod

## Monolithic Ceramics Market Analysis by End-Use Sector

Aerospace

Automotive & Transportation

Defense & Military

Electrical & Electronics

Healthcare

Power Generation

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Automotive & Transportation

Defence & Military

Electrical & Electronics

Healthcare

Power Generation

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AGC Ceramics Co Ltd

Allied Mineral Products

Almatis GmbH

APC International Ltd

Applied Ceramics, Inc.

Bakony Ipari Keramia Kft

Blasch Precision Ceramics, Inc.  
Central Electronics Ltd  
Ceradyne, Inc.  
CeramTec GmbH  
COI Ceramics, Inc.  
CoorsTek, Inc.  
Corning, Inc.  
Dyson Technical Ceramics Ltd  
Elan Technology  
ENrG, Inc.  
Ferro Corporation  
HC Starck GmbH  
International Ceramics, Inc.  
Jameco  
Kyocera Corp  
Mantec Technical Ceramics Ltd  
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Materion Corp  
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NGK Insulators Limited  
NGK Spark Plug Co Ltd  
Noritake Co Ltd  
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