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# Advanced Ceramics

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US Industry Study with Forecasts for **2017 & 2022**

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Study #3091 | November 2013 | \$5200 | 269 pages

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*Demand will be driven by new applications as well as increasing adoption in already established applications due to advanced ceramics' superior material and performance properties.*

## US demand to rise 5.1% annually through 2017

Demand for advanced ceramics in the United States is forecast to increase 5.1 percent annually to \$13.6 billion in 2017. Demand will be driven by the development of new applications for advanced ceramics as well as increasing adoption in already established ceramic applications due to superior material and performance properties. These trends will be most pronounced in the medical, transportation, and machinery markets, all of which will display growth at above average paces. Growth will accelerate in the large electrical and electronic components markets, though advances will remain modest and limit faster increases for advanced ceramics overall. The defense market will remain depressed from its 2007 peak due to tight public sector budgeting, a reduction in asymmetric combat equipment requirements, and withdrawal of American forces from Iraq and Afghanistan.

## Bioceramics market to offer good growth prospects

The above average growth in bioceramics will be driven by new applications. New bioceramic applications such as dental implants, orbital eye implants, and prosthetic components will help drive the medical products market at a double-digit annual pace over the forecast years, the fastest of any market. A shift in doctors' preference toward ceramic products in existing orthopedic applications (especially hip replacements) will

## US Advanced Ceramics Demand (\$13.6 billion, 2017)



support rising demand as well, as competing materials fall out of favor.

In transportation markets, rising efficiency standards and more stringent emissions requirements will drive demand not only for advanced ceramic filters and catalyst supports, but also for ceramic engine parts. The key driver of demand in transportation markets will be particulate filters due to increasing heavy-duty truck production. Catalyst supports and engine components will also contribute to a strong performance for advanced ceramics in this market. Increasingly, high-pressure, high temperature operating environments will further ceramic demand because they require engine parts which offer greater compressive

strength and wear resistance than traditional materials.

Advances in multiple markets can often support one another. For instance, next generation jet turbines have applications for new ceramic composite parts that are machined to tight tolerances. Increasingly, industrial machinery and advanced manufacturing processes require bearings, wear parts, and tools which will remain operational even under the harshest or most demanding environments. In the machinery market, ceramic materials will be steadily adopted due to their superior performance characteristics. This rise in demand will be further aligned to a general shift toward onshoring of advanced manufacturing.

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## Sample Text, Table & Chart

### CLASSES & PRODUCTS

#### Bioceramics

Demand for bioceramics is the fastest growing market for advanced ceramics. The population of new applications of these products is expected to be a limited one while changes to the health insurance marketplace may be unpredictable, though expectedly positive, impact on the total number of orthopedic procedures performed each year.

Advanced ceramics are suitable for use in dental and orthopedic applications due to their hardness, smoothness, and biocompatibility. One of the key characteristics, the last of which allows these materials to function inside the body without causing rejection. In fact, bone, muscle, and other tissues tend to grow around and through ceramic implants (a property called bioconductivity), bonding with them as if they were natural bone. Several new types of implant take advantage of bioconductivity and can replace parts of bone that have been destroyed, including small pieces of the tibia and skull. A small ceramic plate is implanted and, eventually, bone and blood vessels will regrow over the implanted matrix. Ceramic materials used in bioceramic products include alumina and zirconates. These materials are used to produce components for both orthopedic and dental applications.

Advanced ceramic materials demand in dental components substituted more than 80 percent of overall bioceramic demand in 2012, though like orthopedic components this is a very young market. For instance, after several years of popular use in Europe, in 2007 the US Food and Drug Administration (FDA) approved all-ceramic endosseous ("into bone") dental root implants for the US market. These root implants go by the brand names of C...

100

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SAMPLE  
TEXT

TABLE V-8

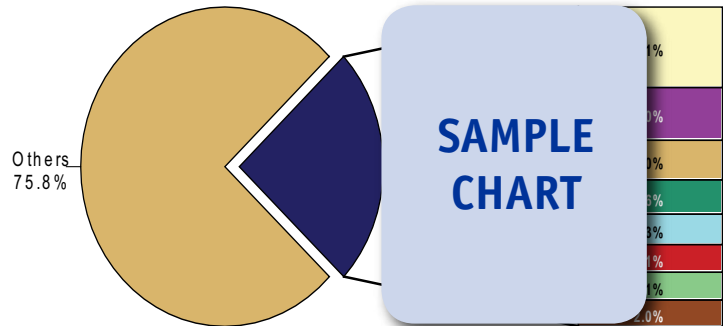
### TRANSPORTATION EQUIPMENT MARKET FOR ADVANCED CERAMICS (million dollars)

Item	2002	2007	2012	2017	2022
Transportation Equipment Shpts (bil \$)	0	0	0	0	0
\$ ceramics/000\$ transportation	3	3	3	3	3
Transport Equip Advanced Ceramics	2	2	2	2	2
By Segment:					
Motor Vehicles	0	0	0	0	0
Aerospace & Other	0	0	0	0	0
By Class:					
Monolithic Ceramics	0	0	0	0	0
Ceramic Coatings	0	0	0	0	0
Ceramic Matrix Composites	0	0	0	0	0
% transportation equipment	0	0	0	0	0
Advanced Ceramics Demand	6	6	6	6	6

SAMPLE  
TABLE

CHART VI-1

### ADVANCED CERAMICS MARKET SHARE, 2012 (\$10.6 billion)

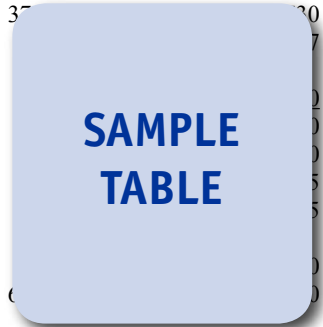


SAMPLE  
CHART

## Sample Profile, Table & Forecast

**TABLE III-4**  
**ZIRCONATE CERAMICS DEMAND**  
(million dollars)

Item	2002	2007	2012	2017	2022
Manufacturers' Shipments (bil \$) \$ zirconate ceramics/000\$ mfg	37	40	45	50	55
Zirconate Ceramics Demand					
Electrical Equipment					
Machinery					
Medical Products					
Other Markets					
% zirconate Advanced Ceramics Demand					



**COMPANY PROFILES**

**CerCo LLC**  
 453 West McConkey Street  
 Shreve, OH 44676  
 330-567-2145  
 http://www.ce

Annual Sales:  
 Employment:

Key Products: grinding media, ceramic linings, ceramic

**SAMPLE PROFILE**

CerCo produces and sells kiln furniture, ceramic armor, grinding media and mill linings, wear resistant ceramic products, and advanced structural components for the ceramics, electronics, aerospace, brick and clay, coal power, minerals, military, automotive, chemicals, steel, and other industries. The Company is privately held.

The Company is involved in the US advanced ceramics industry through the production of structural ceramics, alumina ceramic linings, ceramic grinding media, and ceramic coatings. Structural ceramics products from CerCo are intended for use in such applications as ball valve components, thermal components, electronics, prototyping, fluid handling components, body armor, and microwaves. Typical properties of these ceramics products include high mechanical strength; extreme temperature stability; impenetrability to liquid and gases; and resistance to electricity, wear, corrosion, and chemicals. Among CerCo's structural ceramics products are ZIRMONITE ceramics for fluid handling applications, and DIAMONITE alumina oxide products.

CerCo's alumina ceramic linings are designed to offer resistance to abrasion, corrosion, wear, and erosion for such material handling

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**STUDY COVERAGE**

This Freedonia study, *Advanced Ceramics*, provides historical data (2002, 2007, 2012) plus forecasts for 2017 and 2022 by material, market, class and product. This study also considers key market environment factors, assesses industry structure, evaluates company market share and profiles 34 competitors in the US industry.

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**OTHER STUDIES**

**World 3D Printing (Additive Manufacturing)**

World demand for 3D printers, materials and software will rise 21 percent yearly to \$5 billion in 2017. North America will remain the largest market while developing regions will grow the fastest. Plastics will continue to lead materials demand but will be outpaced by metals. The medical and dental market will offer some of the best opportunities. This study analyzes the \$2 billion world 3D printing industry, with forecasts for 2017 and 2022 by product, market, world region, and for 14 countries. The study also evaluates company market share and profiles industry players.  
 #3123 .....December 2013 ..... \$6100

**Fiber-Reinforced Plastic Composites**

US demand for fiber-reinforced plastic (FRP) composites will climb 4.7 percent annually to 4.3 billion pounds in 2017, valued at \$22.9 billion. Motor vehicles will remain the largest market while construction will grow the fastest as it rebounds from the 2007-2012 period. Both thermoset and thermoplastic FRP composites will grow in line with the average. This study analyzes the 3.5 billion pound US FRP composites industry, with forecasts for 2017 and 2022 by fiber, product and market. The study also evaluates company market share and profiles industry players.  
 #3092 .....October 2013 ..... \$5100

**High-Temperature Plastics**

US demand for high-temperature plastics will rise 5.8 percent per year to \$3.1 billion in 2017. Advances in the key fluoropolymers segment will trail the average growth rate, but these resins will continue to offer the best opportunities for growth. Polyketones, polyphenylene sulfide, and sulfone polymers will achieve the fastest gains from smaller bases. This study analyzes the \$2.4 billion US high-temperature plastics industry, with forecasts for 2017 and 2022 by resin and market. The study also evaluates company market share and profiles industry players.  
 #3053 .....June 2013 ..... \$5100

**Coated Fabrics**

US coated fabrics demand will rise 3.5 percent annually to 635 million square yards in 2016. Motor vehicles will remain the largest market, with good prospects for airbags. Renewed construction activity will benefit wallcoverings, furniture, and awnings and canopies. Polypropylene and polyethylene coated fabrics will be the fastest growing products. This study analyzes the 535 million square yard US coated fabric industry, with forecasts for 2016 and 2021 by coating, substrate and market. The study also evaluates company market share and profiles industry players.  
 #2936 .....September 2012..... \$5100

**World Nanomaterials**

World demand for nanomaterials will rise more than two-and-a-half times to \$5.5 billion in 2016. Nanotubes, nanoclays and quantum dots will be the fastest growing types. The energy storage and generation and construction markets will offer the best growth prospects. China, India and the US will lead gains among countries. This study analyzes the \$2 billion world nanomaterial industry, with forecasts for 2016 and 2021 by material, market, world region and for 15 countries. The study also considers market environment factors and profiles industry players.  
 #2871 ..... May 2012..... \$6100

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