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A new Market Report on the Engineering Ceramics Industry....

ENGINEERING CERAMICS IN EUROPE AND THE USA

A MARKET AND STRATEGIC STUDY TO THE YEAR 2016

By John Briggs, Enceram

ISBN 1 871677 63 7 (Published June 2011)

- The markets for engineering ceramics (covering mechanical, medical, environmental and thermal applications) were valued at approximately €2.6 billion (\$3.2 billion) in Europe (EU27 countries) and \$1.7 billion (€1.4 billion) in the USA in 2010.
- Consumption of engineering ceramics is expected to reach over €3.1 billion in Europe and over \$2 billion in the USA by the year 2016, corresponding to average annual growth rates of 3.1% and 2.7% respectively.
- Sectors with the highest growth rates are, currently, bioceramics (especially dental ceramics), bearings, membranes and various wear parts in both the USA and Europe, and diesel particulate filters in Europe. Future trends in these and other application areas are analysed in detail.
- Production and application technology trends are assessed and new markets emerging between 2011 and 2016 are identified. Recent and on-going research and development activities are discussed, covering both US-funded and EU-funded work.
- Demand for the various ceramic raw materials are analysed. In addition, market shares of the main ceramics are presented by value and weight.
- International trade aspects are discussed, and the markets in the USA and European countries are analysed. Overall, Germany consumes about 35% of the European total. The USA is a net importer of engineering ceramics while Europe, especially Germany, produces more than it consumes.
- The activities of more than 120 companies are reviewed, including new acquisitions and joint ventures. Estimates of their share in the different engineering ceramic product categories are also provided. In the EU and USA, six multinational companies supply about 59% and 67% respectively of the total engineering ceramics demand.

AVAILABLE NOW - *Engineering Ceramics in Europe and the USA: A Market and Strategic Study to the Year 2016*, a 300-page market report that analyses the European and North American markets for engineering ceramics (also known as advanced ceramics), discusses the demand for various materials and products, and highlights new commercial opportunities. In the recent past, the possibilities offered by engineering ceramics have become recognised across a wide range of industrial applications, where their outstanding properties allow cost savings due to extended component lifespans in duties where metals and other materials may fail.

Featuring over 130 tables, the report provides a detailed analysis of the 2010 and projected 2011, 2013 and 2016 markets for engineering ceramics in the USA and Europe (including all EU27 countries), covering ten categories of products. These categories are broken down further into numerous product sub-groups (see Table of Contents on next page). The activities of over 120 companies and their subsidiaries are reviewed, including key financial results and market position. The research and development activities being conducted in both Europe and the USA are also discussed.

Trends highlighted in the report include:

- In bioceramics, the proportion of ceramic-on-ceramic hip joints has grown rapidly. Alumina femur heads are widely used whereas zirconia is rarely applied in hip replacements now. Other ceramic prostheses, such as knees, fingers and spinal implants, are also assessed.
- The demand for ceramic armour (mainly silicon carbide, boron carbide and alumina) in the USA, which expanded very rapidly in 2004-2006, has shrunk dramatically, though modest growth should be seen in the medium term. European demand for armour remains lower than that of the USA.
- Catalyst supports in automobile engine exhausts are now ubiquitous in the USA and Europe. However, the market for ceramic filters for diesel-engine automobiles is much bigger in Europe than in the USA. New EU legislation will stimulate demand for these filters in trucks after 2013.
- Ceramic cutting tool inserts allow high speed cutting and milling of cast iron. Silicon nitride inserts are still gaining market share. Coated versions now form a significant part of the overall market.
- Hybrid ceramic bearings with silicon nitride balls in steel races now dominate in several applications, such as machine tool spindles and military aircraft engines. Growth rates of over 4% a year are expected.
- The market for filters for molten metals is growing strongly, though the levels of 2007 have still not been regained.
- Large quantities of alumina milling media are consumed in the traditional ceramics industry (tiles, whitewares, etc).
- Demand for ceramic wear parts is expected to see good growth, particularly in those areas where performance over metals leads to long-term cost savings. Specific parts include wear plates, faucet/tap plates, nozzles and valves.
- In kiln furniture, silicon carbide is still a growing market, whereas the market for cordierite is shrinking. The European market for kiln furniture is three times the size of that in the USA.
- Ceramic membranes purify water, drinks, gases, pharmaceuticals and foodstuffs. Demand in both geographic areas is growing at 5-6% a year.

These and many other facts and figures are given in *Engineering Ceramics in Europe and the USA: A Market and Strategic Study to the Year 2016*. The 300-page market report is aimed at companies manufacturing engineering ceramic products, as well as ceramic raw materials processors, production/test equipment suppliers, consultants and others interested in this important, dynamic industry.

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Markets for Ceramic Seals

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Molten Steel Handling Components

Shrouds, Stoppers and Nozzles

Sliding Gate Plates

Other Wear Parts

Milling Media

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The report provides essential information on key companies, including:

- Advanced Cerametrics Inc
- Almatis GmbH
- Amedica Corp
- Applied Ceramics Inc
- Astra Tech AB
- Astro Met Inc
- BAE Systems, Advanced Ceramics (*Armor Holdings, Advanced Ceramics Research*)
- Baikowski International Corp
- Barat Ceramics GmbH
- BASF
- Industrie Bitossi SpA
- Blasch Precision Ceramics Inc
- Boxitogorsk Alumina JSC
- Brace GmbH
- Burton GmbH & Co KG
- Ceradyne Inc (*ESK Ceramics GmbH & Co. KG*)
- Ceramaret SA
- Ceramic Protection Group
- C ramiques Techniques & Industrielles SA
- CeramTec AG (*CeramTec ETEC*)
- Cera System GmbH
- Ceratizit SA
- CerCo LLC (*CTI*)
- Cerobear GmbH
- Clariant (*Kion Specialty Polymers*)
- COI Ceramics Inc
- Cookson Group plc
- CoorsTek Inc
- Corning Inc (*Cormetech Inc*)
- Covalent Materials Corp
- Cummins Inc
- Daiichi Kigensu KK Co Ltd
- Denki Kagaku Kogyo KK (*Denka*)
- Didier-Werke AG
- Doceram GmbH
- Drache Umwelt Technik
- Du-Co Ceramics Co
- Dynamic-Ceramic Ltd
- ECO Ceramics BV
- Elkem A/S
- Enceratec Corp
- ESD-SIC BV
- ESK-SIC GmbH
- Fairey Industrial Ceramics Ltd
- FCT Ingenieurkeramik GmbH
- Porzellanfabrik Frauenthal GmbH
- Friatec AG
- GAT Katalystatoren GmbH
- Greenleaf Corp
- Haldor Tops e AS
- Heany Industries Inc
- HOB Certec Sro
- Hofmann Ceramic GmbH
- Honeywell Ceramic Components
- Ibiden DPF France SAS
- Imerys Group (*Imerys Kiln Furniture, Timcal Ltd, UCM Advanced Ceramics*)
- Industrial Filter & Pump Manufacturing Co
- Inmatec Technologies GmbH
- International Syalons Ltd
- IPS Ceramics
- Iscar Ltd
- Ivoclar Vivadent
- Johnson Matthey plc (*Argillon GmbH*)
- Kalenborn Kalprotect GmbH & Co KG
- Kennametal Inc (*Boride Products, Hochtechnologie Materialien AG, Sintec*)
- Kerafol Keramische Folien GmbH
- Krosaki Harima Corp
- Kyocera Corp
- LiqTech A/S
- LWB Refractories GmbH
- Martinswerk GmbH
- Mathys AG
- MCubed Technologies Inc
- Metoxit AG
- Morgan Crucible Co plc (*Carpenter Advanced Ceramics, Certech Inc, W Haldenwanger Technische Keramik GmbH & Co KG, NP Aerospace*)
- Nabaltec AG
- Nanophase Technologies Corp
- Neoceram SA
- NGK Insulators Ltd
- NGK Spark Plug Co Ltd
- Nobel Biocare AG
- Noritake Co Ltd
- Novaref SpA
- Novasep Environmental SAS
- Oxidkeramik J Cardenas GmbH
- Pall Corp (*Pall Exekia, Pall Filtersystems Werk Schumacher*)
- Porvair plc (*Selee*)
- PremaTech Advanced Ceramics
- The Protective Group Inc
- Pyrotek Inc
- Rath AG
- Rauschert GmbH
- Refractron Technologies Corp
- Refratechnik GmbH
- RHI (Radex-Herakliith Industriebeteiligungs) AG
- Rio Tinto Alcan Inc
- Saint-Gobain (*CeramClean, Saint-Gobain Industrial Ceramics, ZirPro*)
- Sanac SpA
- Sandvik AB (*Kanthal AB, Rexam Tooling*)
- Saphirwerk Industrieprodukte AG
- Schunk Ingenieurkeramik GmbH
- Sembach GmbH & Co KG
- SGL Carbon Group
- Shenango Advanced Ceramics LLC
- Showa Denko KK
- Soci t  des C ramiques Techniques (SCT)
- H C Starck GmbH (*H C Starck Ceramics GmbH*)
- Starfire Systems Inc
- Steuler Industriewerke GmbH
- Straumann AG
- S d-Chemie AG (*ASK Chemicals*)
- Superior Graphite Co
- TaeguTec Ltd
- TAMI Industries SA
- Tenmat Ltd
- Toshiba Ceramics Co
- Tosoh Corp
- TYK Corp (*TYK Refractories Co*)
- Umicore Group
- US Refractories Inc
- Veolia SA
- Vesta Ceramics AB
- Vesuvius Group (*Foseco, Goebel-Werk GmbH*)
- VITA Zahnfabrik
- Washington Mills Electro Minerals Corp

(NOTE: In the listing above, the companies given in italics are subsidiaries or associate companies of the company listed immediately before them).

ABOUT THE AUTHOR

The report's author John Briggs founded Enceram as a consultancy in 1984. Enceram specialises in marketing and technical aspects of ceramics – particularly advanced ceramics – and related materials. Dr Briggs has more than 35 years experience of research, development and marketing in the field of ceramics, and during this time has held senior technical posts in the ceramics industry and lectured at the University of Surrey. He has been responsible for numerous authoritative multiclient market reports, covering ceramics, refractories, abrasives and other inorganic materials. Dr Briggs is the author of previous versions of the present report, published in 2003 and 2007.