



Uniceram Advanced Materials, Inc.

.....A provider of quality ceramic products.....





Uniceram Advanced Materials, Inc.

Company Introduction

Allow us to introduce our company, Uniceram Advanced Materials, Inc. a provider of quality ceramic products.

We have a wide array of products that serve a broad spectrum of industrial applications. Our products, typically, may be classified to four categories on basis of their end use:

- Insulators
- Wear Resistant Parts
- Porous Filters
- Refractory Products

Our core ability is the ability to customize and innovate. With the backing of the solid experience of our product development team, we are in a position to manufacture products as per our customer's pricing and technical requirements. For us, component geometry is not a restriction. As we say, if you can draw it, we CAN make it.

Uniceram Advanced Materials has dedicated manufacturing units at two locations around the world. Both these locations are ISO 9001 certified. Our expertise in supply chain management enables us to have the optimum quality at the optimum price.

We have been in this field for more than 25 years and have developed the technology indigenously, so have total mastery over managing the efficiency of the applications. We believe in adding competitive advantage to the client by enhancing the operational effectiveness of their processes.

Uniceram Advanced Materials is a quality conscious organization: All our vendors are ISO9001 Certified for their quality assurance in design, development, production and delivery. This shows our commitment to quality. We believe in setting very high standards to exceed the expectations of our customers.

If you have any queries about our products or need more information, feel free to contact us.

We look forward to having a long and a mutually beneficial business relationship with you. Count on us to deliver the best, always!

Thanks,

The Uniceram Team

**3883 Rogers Bridge Road, Suite 304B, Duluth, Georgia 30097 Tel: 678 957 0896 / 973 941 7427 Fax: 678 475 1823
E-mail: info@uniceramusa.com**



Uniceram Advanced Materials, Inc.

Our Product Range:

+ **Wear Resistant Parts-**

- Textile and Wire Drawing guides
- Mechanical and Chemical Seals
- Alumina Grinding Media
- Yttria Stabilized Zirconia Microgrinding Media and Structural Ceramics
- Ceramic Coatings

+ **Insulators-**

- Resistor Casing
- Fuse Bodies
- Ignitors
- Heat Resistant Interlocking Beads

+ **Porous Filters-**

- Honey Comb Filters
- Acid Filters
- Vaporization wicks

+ **Refractory Materials-**

- Crucibles
- Ferrules
- Thermocouple Sheaths and other labware.
- Coil Supports
- Infra-Red Heaters
- Assay Testing Ceramics
- Ceramic Rollers for Tile Industry
- Refractory products for Steel, Iron, Glass and Cement Industry
- Water Ground Mica



Uniceram Advanced Materials, Inc.

Product Introduction: Alumina Components



Our Alumina Components cover a versatile range of applications ranging from wear resistant applications like use in pump industry or use as Igniters due to their high temperature and electrical resistance. We produce these products by various process technologies such as Uni-axial Pressing, Isostatic Pressing,

Extrusion and injection molding. The manufacturing process is based on the component size, geometry and the required production volume. Since the technology has been developed by us, we know how to manage the critical parameters to produce the best quality products. We can machine the components to **very close tolerances** and can give a high surface finish of **Ra<0.2 microns**. This speaks volumes about our technical capabilities.

Our standard materials for wear resistant ceramics include alumina (from 85% to 99.8%), Yttria Stabilized Zirconia and Silicon Carbide. Chemically inert and having hardness only surpassed by diamond (9 on Mohs Scale), they are capable of withstanding high temperatures and extremely corrosive environment. These are an ideal choice for enhancing the component life.

However, the materials, the product, the processes do not define our core competence. Our core ability is the ability to customize and innovate. With the backing of the solid experience of our product development team, we are in a position to manufacture products as per our customer's pricing and technical requirements. For us, component geometry is not a restriction. As we say, if you can draw it, we CAN make it.



Uniceram Advanced Materials, Inc.

Ceramic Pump Components



Uniceram Advanced Materials High Wear Resistant pump components include pistons, plungers, wear plates, bushes, liners and sleeves and mechanical and chemical seal rings. These are typically used in Jet Pumps, Water Jetting Pumps, High Pressure Pumps and High Pressure Water Supply Pumps, which find tremendous applications in industries

including Automobiles, Chemical and Petrochemicals, Foundries, Oil Refineries, Paper and Pulp Manufacture, Cement Manufacturing, Food Processing, Thermal Power Plants and Steel Plants etc.



Chemical and Mechanical Seal Rings

Uniceram's Pump Seal Rings of high purity material have added a new dimension to mechanical seal design. These are available in 80% to 99.8% Alumina as well as Silicon Carbide. These have wide applications in industrial and automobile water pumps.

Finished tolerances of 0.05 mm, high degree of flatness (<2 light band) and excellent surface finish are the typical product characteristics with high hardness, high mechanical strength and an excellent resistance to wear. While we offer certain standard sizes, we also offer a high degree of customization. We can tailor the components as per the customer's



drawing, bearing in mind the technical and pricing specifications. With our expertise in supply chain management, we are in a position to adhere to the most stringent delivery requirements.



Uniceram Advanced Materials, Inc.

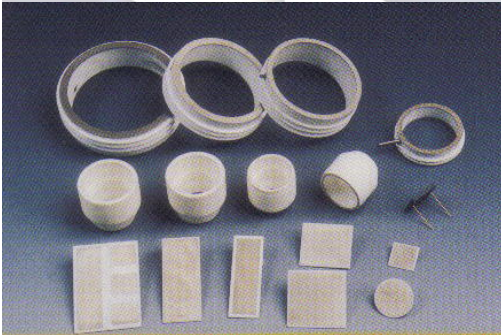
Alumina Igniters and Insulators



Lighting of burners, using oil or gas as their fuel, is achieved by a spark generated between a pair of high voltage insulated electrodes placed near their burners. For this purpose, we have developed high Alumina insulators. These are typically made from 95% Alumina to 99%

Alumina. Their excellent mechanical and dielectric strength increase their operational safety.

The adjoining pictures show some of the typical highly customized insulators developed by us for specific end applications. This was done by going through a detailed analysis of the end application and then working on designing



and testing prototypes to get the final product in to the hands of the end users. We can also provide insulators with metal inserts.



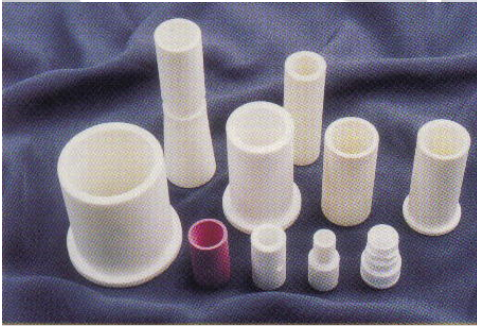
Uniceram Advanced Materials, Inc.

Alumina Textile Guides

For applications involving high abrasion like the drawing of wire/yarn, thread and wire guides made of alumina are ideal components. The fine surface finish, high hardness and chemical inertness to corrosion provides for longer life, reduced die wear and consequently a better quality output for the users. For further information on our standard textile components, please ask for our standard catalogue.



Alumina Customized Products



These products are designed to specific end applications, keeping in mind the customer's technical and commercial needs. This is our core strength: giving a product that matches your needs to the 'T'. These include high temperature ferrules, high wear inserts for wear resistance and even applications demanding high insulation.

For more information on our products, please contact us at [**info@uniceramusa.com**](mailto:info@uniceramusa.com)



Uniceram Advanced Materials, Inc.

Specifications Sheet for Alumina 997 components

Alumina Content	99.7%
Density (g/cm³)	3.9
Hardness (Rockwell@45N)	83
Elastic Modulus (GPa)	370
Poisson Ratio	0.22
Tensile Strength (MPa)	260
Fracture Toughness(MPa m^{1/2})	4 – 5
Compression Strength (MPa)	2600
Thermal Conductivity (W/m °K)	30
Flexural Strength (MPa)	375
Coefficient of Thermal Expansion (/^oC)	8.2 x 10 ⁻⁶
Maximum Application Temperature	1750 °C
Specific Heat (J/kg*K)	880
Color	Ivory

Please note that the above results are from test samples and should be used on for guidance

If there are any queries, please feel free to contact us at info@uniceramusa.com



Uniceram Advanced Materials, Inc.

Mechanical Properties of Alumina Materials

PROPERTIES	UNIT	TEST	Nom 88% Al ₂ O ₃	Nom 96% Al ₂ O ₃	Nom 99.5% Al ₂ O ₃	Nom 99.5% Al ₂ O ₃
MECHANICAL PROPERTIES Colour			White	Pinkish Ivory	Pinkish Ivory	Ivory White
Density	g/cc	ASTM C20-83	3.4	3.75	3.9	3.3
Hardness (Rockwell)	R45N	ASTM E 18	73	80	83	-
Water Absorption	%	ASTM C 373-72	0	0	0	5%
Gas Permeability	-	Helium Test	0	0	0	-
Flexural Strength 20°C (MOR)	MPa	ASTM F417-78	317	358	379	80
Elastic / Weight 20°C	GPa	ASTM C848-78	221	303	372	-
Stiffness / Weight 20°C	GPa/g/cc	-	65	81	96	-
Compressive Strength 20°C	MPa	ASTM C77-82	1930	2068	2620	-
Tensile Strength 25°C	MPa	ASTM TEST4	155	193	262	-
			-	96	-	-
FRACTURE TOUGHNESS * 10	MPa m 1/2	Notched Beam Test	3-4	3-4	3-4	-
WEAR & CHEMICAL PROPERTIES Corrosion	mg/cm ² /day	95% H ₂ O ₄ @ 20°C-Note 1 95% H ₂ O ₄ @ 100°C-Note 1	0.04 1.00	- -	0.01 0.1	Use Kiln Furniture
THERMAL PROPERTY Maximum Use Temperature	°C	No load conds	1500	1600	1750	1700

Please note that the above results are from test samples and should be used on for guidance

If there are any queries, please feel free to contact us at info@uniceramusa.com

Typical applications include wear resistance applications such as Chemical and Mechanical Seal Rings, Spray Nozzles, Paper Cutting equipment, Steel manufacturing, Textile Manufacture, Petrochemicals et.al.