



## ***Zirconia Components for Wear & Corrosion***



- ***Zirconia Materials***
- ***Mg-PSZ & Y-TZP***
- ***Tubes, Plates, Discs, Balls, Rods, Blanks & Finished Components***
- ***Excellent Wear & Corrosion Resistance***

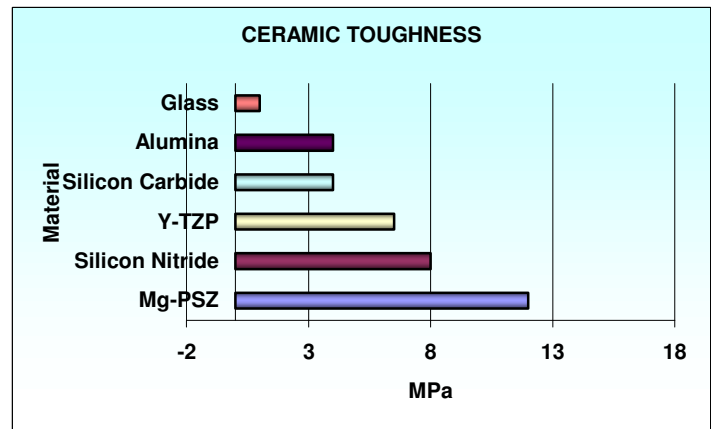
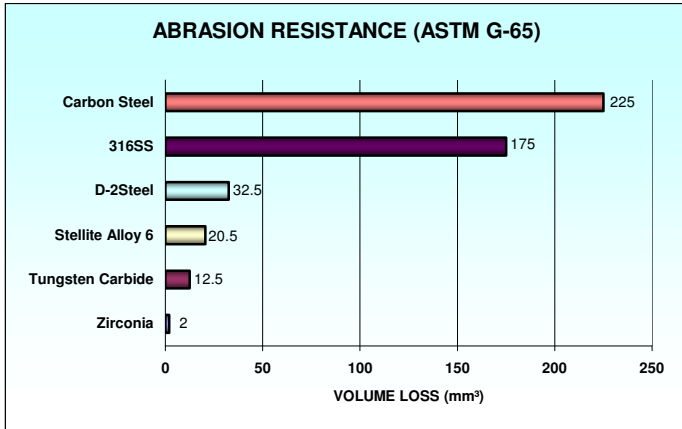
Refractron Technologies Corp. is a leading manufacturer of **technical ceramics**. Products include both controlled porosity and densely structured ceramics designed to meet requirements specified by our customers for durability, chemical, corrosion and wear resistance, toughness, and density.

The range of dense **structural ceramics** using proprietary zirconia ceramics includes custom blended ceramic alloy powders formed by isopressing or extrusion to meet customer specifications. Refractron's zirconia is offered in two materials Magnesia Partially Stabilized Zirconia, Mg-PSZ and Ytria Tetragonal Zirconia Polycrystal, Y-TZP. Refractron's structural ceramic zirconia materials provide excellent erosion, corrosion and abrasion resistance along with temperature resistance, fracture toughness and strength. These ceramic alloy components are used in extreme service applications that take advantage of their superior wear and corrosion resistance. Numerous applications for these materials are in the chemical and petrochemical industry providing economic payback in the way of reduced maintenance and down time. Zirconia is also becoming the material of choice for components in healthcare and dental applications.

This dense structural ceramic material is usually precision ground using conventional diamond cutters and wheels. Machines used for precision grinding include: surface grinders, CNC milling machines, jig grinders, center less grinders, CNC lathes, ID grinders, etc.

The types of dense, structural ceramic components produced by Refractron include: valve components, pump liners, plugs, sleeves, pistons, precision ceramic balls, spools, press tooling, dental blanks, extrusion tooling and wear plates. Other specialty products include a range of porous ceramic filters, diffusers and adsorbent filter/drier cores for refrigeration applications, dispersion parts, vacuum chucks, inkpads and gas probes.

We work closely with our customers to define their needs and the requirements of each specific structural ceramic application. Our engineering and sales team is great at attacking technical design and process problems, then customizing an innovative solution using our broad range of **advanced industrial ceramics**. Contact us with your application requirements



### Refractron Zirconia Ceramic Properties

	<b>Mg - PSZ</b>	<b>Y-TZP</b>	<b>Y-TZP(H)</b>
<b>Chemistry (wt%)</b>			
ZrO <sub>2</sub> + MgO or Y <sub>2</sub> O <sub>3</sub> + HfO <sub>2</sub> + Al <sub>2</sub> O <sub>3</sub>	> 99.95	> 99.5	> 99.5
<b>Physical Properties (typical)</b>			
Density (g/cm <sup>3</sup> )	5.75 - 5.85	6.05	6.08
Porosity (%)	< 0.5	< 0.5	0.05
Color	White	White	White
Grain Size (microns)	30 - 40	< 0.5	< 0.5
<b>Mechanical Properties (typical)</b>			
Fracture Toughness (MPa.M <sup>1/2</sup> )	10	8	8
Young's Modulus (GPa)	200	210	220
Flexural Strength (MPa)	620	900	1400
Hardness Hv (GPa)	10.7	13	13.5
Compressive Strength (MPa)	1760	2500	2580
<b>Thermal Properties (typical)</b>			
Thermal Conductivity (W/m <sup>2</sup> k)	2.18	2.18	2.18
Coeff. Of Thermal Expansion (25°C-1000°C)	10.0	10.2	10.2
Max. Use Temperature (°C)	500	1500	1500
<b>Electrical Properties (typical)</b>			
Dielectric Strength (volts/mil)	235 - 240	225 - 230	225 - 230
Dielectric Loss (1MHz @ 25°C)	0.001	0.001	0.001
Volume Resistivity (Ohm-cm @ 25°C)	> 10 <sup>13</sup>	> 10 <sup>13</sup>	> 10 <sup>13</sup>

**NOTE:** All statements, technical information and recommendations in this literature are based on tests we believe to be reliable and accurate. Before using or purchasing products described, the buyer shall determine the suitability of the component for its final use. The buyer shall assume all risk and liabilities associated with the final product use.