CeramAlloy ATZ
High Performance Alumina-Zirconia Toughened (ATZ) Ceramic Composite

Alumina-Zirconia (ATZ) and Zirconia-Alumina (ZTA) high performance ceramic composites are unique ceramic materials by way of exhibiting a combination of high hardness, strength, wear and corrosion resistance characteristic to their Alumina component while still maintaining reasonably high fracture toughness specific to its Zirconia component.

Precision Ceramics offers a range of Alumina-Zirconia ceramic composite materials in different proportions between its main constituents covering a wide range of mechanical properties and intended uses.

Key properties
- Use temperatures up to 1500°C
- Chemical inertness
- Wear resistance
- High bending strength
- High fracture toughness
- High hardness
- High strength Alumina-Zirconia ceramic composite
- Sintered to near theoretical density or HIPped for enhanced reliability
- Higher strength than Zirconia while maintaining fracture toughness
- Ideal for application where higher mechanical strength is critical

Applications
- High pressure equipment - ball valve balls and seats
- Rollers and guides for metal forming
- Thread and wire guides
- Metal extrusion dies
- Deep well down-hole valves and seats
- Shaft bearings/bushings

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<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td>Density (g/cm³)</td>
<td>4.3</td>
</tr>
<tr>
<td>Flexural Strength (MPa)</td>
<td>1800 (HIP)</td>
</tr>
<tr>
<td>Compressive Strength (MPa)</td>
<td>2500</td>
</tr>
<tr>
<td>Young's Modulus (GPa)</td>
<td>340</td>
</tr>
<tr>
<td>Poisson Ratio</td>
<td>0.23</td>
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<tr>
<td>Hardness HV0.5 (GPa)</td>
<td>14</td>
</tr>
<tr>
<td>Fracture toughness KIC (MPa/m²)</td>
<td>8</td>
</tr>
<tr>
<td>Max use temperature (°C)</td>
<td>1200</td>
</tr>
<tr>
<td>Thermal expansion coefficient (x10⁻⁶/°C)</td>
<td>8</td>
</tr>
<tr>
<td>Thermal shock resistance (ΔT°C)</td>
<td>225</td>
</tr>
</tbody>
</table>

*N*KIC toughness as measured by the indentation method

N.B. Values presented are mean values for the samples tested and are given as an indication only for the purpose of comparing between different materials. The properties of the actual material might vary slightly and could be affected by the shape and size of the part.