Zirconia powders for technical ceramics

Saint-Gobain ZirPro has always clearly demonstrated its commitment to developing, in partnership with customers, products most suited to a wide range of applications. As a result, we provide all the necessary support during the product engineering and development phases.

This commitment relies on the expertise and resources of the European Research Center, Saint-Gobain CREE based in Cavaillon, France, near one of the Saint-Gobain ZirPro production sites.

This center offers:
- Outstanding research and analysis equipment: SEM, micro-probe, X-ray diffraction, DTA-TGA (differential thermal analysis - thermal gravimetric analysis), Vickers micro-hardness, MOR, ICP spectrometry, BET surface area measurement, grain size distribution...
- A team specifically dedicated to research and development of new products, has access to process equipment, including pilot scale.
- Application and after-sales service for Saint-Gobain ZirPro products, using a wide range of internal resources.

The SEPR site (Le Pontet - France) of Saint-Gobain ZirPro is certified ISO 9001 for the design, manufacture and distribution of ceramic powders, and QS 9000 for the design, manufacture and distribution of special zirconia for the automotive industry.

All the professional teams of Saint-Gobain ZirPro are at your disposal to examine your specific requirements.
For a given application, several types of zirconia can be used. The choice depends on the purity level, reactivity and cost requirements. The following table helps direct this choice:

### Applications

**Electronic Ceramics**

Thanks to electrolytic functions, the zirconium oxides are used in the manufacture of the following products:

- PZT Piezoelectric parts
- Oxygen sensors
- Solid Oxide Fuel Cell

**Structural Ceramics**

The peculiar mechanical properties of zirconia (mechanical strength, toughness, etc.) make them ideal for the manufacturing of parts subjected to high stress.

- Mechanical parts: wire guides, pulleys, etc.
- Ferrules

**Thermal Spray Powders**

Zirconium oxide is a raw material for the production of thermal barrier coatings used on turbines (aeronautical, gas, etc.) to extend their service life.

**Specialty Glasses**

Zirconium oxide is used in the composition of specialty glasses (optical glass, etc.) to increase their refractive index.

**Gemstones**

Zirconium oxide, in its cubic form, looks like gems, such as diamonds.

**Petrochemical Catalysis**

Zirconium oxide is used more and more in washcoats for the oil industry.

**Range of products**

<table>
<thead>
<tr>
<th>Electronic Ceramics</th>
<th>Monoclinic zirconia</th>
<th>Stabilized zirconia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal</td>
<td>Chemical</td>
<td></td>
</tr>
<tr>
<td>PZT Piezoelectric parts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygen sensors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid Oxide Fuel Cell</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Stabilization**

- **Monoclinic zirconia**:
  - CC, CS, ZR and ZC are monoclinic zirconia of thermal origin.
  - CZ and CZ-P are monoclinic zirconia of chemical origin.
  - Y2 are yttria stabilized zirconia.
  - Mg2 are magnesia stabilized zirconia.

- **Yttria stabilized Zirconia**:
  - YZ01-YZ01A (3% molar)
    - Structural ceramics, O2 sensors, ferrules.
  - YZ201 (5% molar)
    - Structural ceramics, O2 sensors, ferrules.
  - YZB01 (8% molar)
    - O2 sensors, SOFC

- **Magnesia stabilized Zirconia**
  - MgZ02A
    - "Ready To Press"

For more demanding operating conditions, the use of Y2 yttria stabilized zirconia, spray dried or not, is recommended. This powder is manufactured by a thermal process at a very high temperature. This original process yields perfectly homogeneous grains with remarkable properties after application.

Zirconia MgZ02A is perfectly suited to applications demanding high resistance to corrosion and abrasion. It also extends the Y2 range for applications involving less mechanical stress.