

Zirconia powders for technical ceramics



*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.*

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.



Saint-Gobain ZirPro

Saint-Gobain ZirPro, present for more than 20 years in the area of zirconium oxide powders, offers a wide range of products for applications in the technical ceramics field.

This range includes monoclinic and stabilized zirconia produced by thermal or chemical processes.

Each product is designed in compliance with the requirements of each application: structural ceramics, electronics, etc. The product specifications are discussed together by the customer and Saint-Gobain ZirPro Research and Development teams.

- CC, CS, ZR and ZC are monoclinic zirconia of thermal origin.
- CZ and CZ-P are monoclinic zirconia of chemical origin.
- YZ are yttria stabilized zirconia.
- MgZ are magnesia stabilized zirconia.

Their main applications are briefly listed in the table below.



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.
- Ferules

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

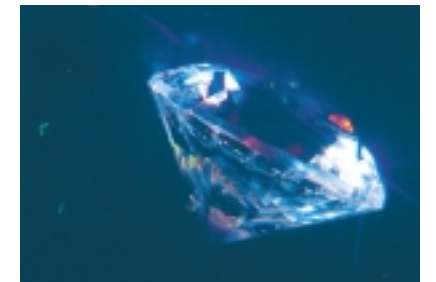
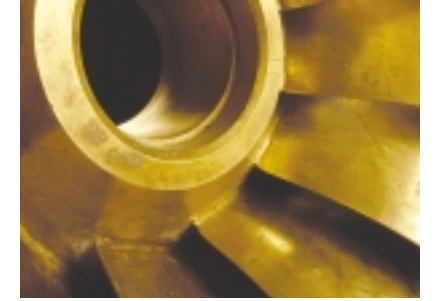
	Monoclinic zirconia		Stabilized zirconia
	Thermal	Chemical	
Electronic Ceramics	■	■	■
Structural Ceramics	■	■	■
Thermal Spray Powders	■	■	
Specialty Glasses	■	■	
Gemstones		■	
Petrochemical Catalysis	■	■	

Monoclinic zirconia

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:

Grain size D50	Purity				
	ZrO ₂ = 98,6 %		99,99 %		
3 μm	CC10	CS10	ZR2/ZC		
	CC05	CS05	ZR100	CZ-5	CZ-P-5
< 1 μm	CC01	CS01		CZ-1	

The purity of the products, their fineness and reactivity are the factors used for developing Saint-Gobain ZirPro product ranges. For each of the products presented, datasheets are available detailing their relevant physical-chemical characteristics. Samples are also available for application testing.



Stabilized zirconia



Yttria stabilized Zirconia:

- YZ01-YZ01A (3% molar)
Structural ceramics, O₂ sensors, ferules.
- Y5Z01 (5% molar)
Structural ceramics, O₂ sensors, ferules.
- Y8Z01 (8% molar)
O₂ sensors, SOFC.

Magnesia stabilized Zirconia “Ready To Press”

- MgZ02A
Structural ceramics, mechanical parts (wire drawing, pumps, valves, etc.)

For more demanding operating conditions, the use of YZ 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 YZ range for applications involving less mechanical stress.

