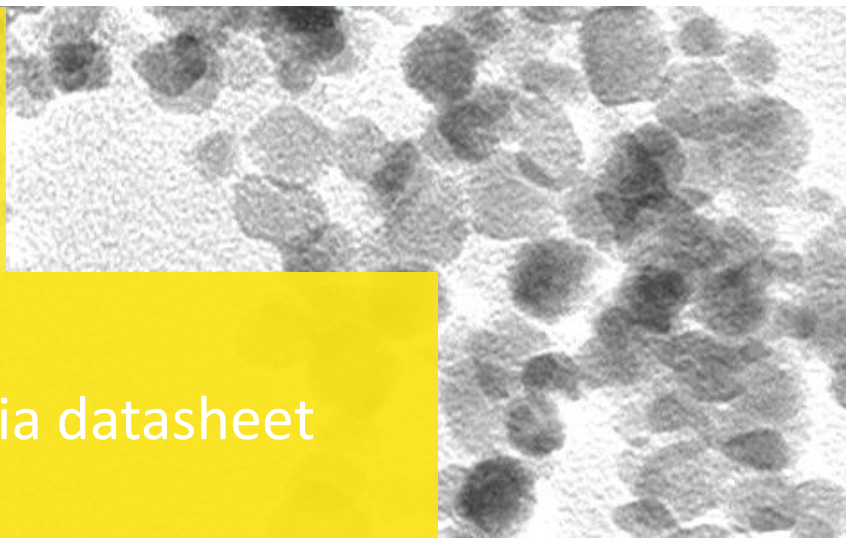
MATHYM

INNOVATIVE NANOMATERIALS

YSZ



Yttria-stabilized zirconia datasheet

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ZrO_2 – 1 to 10 mol% Y_2O_3

1 to 10 mol% yttria-stabilized Zirconia nanoparticles in suspension

Our offer

We offer yttria-stabilized zirconia nanoparticles dispersed in various media for use in a wide range of applications. They can be used as starting materials, or sintering additives, for the fabrication of ceramics and ceramic nano-composites used in structural, biomedical, dental applications and more. They can as well be used to produce nanostructured inorganic coatings. They also find applications as nanofillers in composite materials, for instance dental composites and nanocoatings, and in 3D-printing feedstocks.

We offer as well undoped zirconia dispersions (please refer to the corresponding datasheet), and zirconia containing other dopants like CeO_2 or Gd_2O_3.

Main benefits

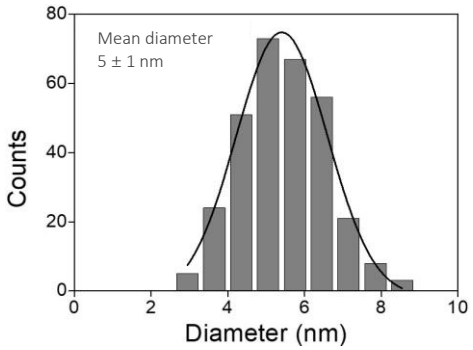
- Smallest nanoparticles on the market
- Highest transparency and low viscosity at high particle loading
- Low organic content
- High sinterability at low temperature
- Fine-grained final ceramics
- Highly translucent final ceramics
- Improved mechanical properties of final ceramics

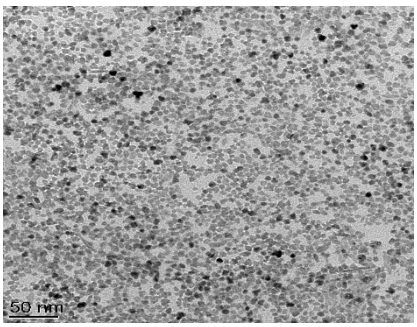
Main properties

Chemical formula	ZrO_2 - 1 to 10 mol% Y_2O_3
Crystal structure of particles	Tetragonal*
Crystal structure of ceramics	Tetragonal
Morphology	Nearly spherical**
Average particle size	5 to 20 nm according to the grade
Density (theoretical)	6.1 g/cm^3 for 3YSZ
Refractive index	≥ 2.10
Dispersion solid content	Up to 70% depending on morphology and dispersion medium
Dispersion medium	Water, alcohol, polyol, acetone, MEK, selected organic solvents, methacrylate-based dental resins Silicone oils, customer specific monomer mixture, e.g., epoxy and fluorene (under development)
Type of functionalization	Depends on dispersion medium and application requirements
Sintering temperature	950 – 1200°C

* Some grades contain a small fraction of monoclinic particles. ** Some grades contain a small fraction of anisotropic particles.

Example of size distribution





Available sample size: 100 g to 400 g of dry matter - Safety Data Sheet available

Provided data are typical values, they are not contractual.

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