

Press Release

Coimbra, Portugal, March 2018

Nanostructured Zirconia-Based Powders for the Most Physically Demanding Applications

(Hall 5 / Stand A16)

Innovnano is a specialist manufacturer of high quality nanostructured zirconia-based powders produced by its unique Emulsion Detonation Synthesis (EDS) process.

Innovnano’s 2mol-% Yttria Stabilized Zirconia (2YSZ) powder offers beneficial properties, such as high flexural strength, ageing resistance and outstanding fracture toughness. It has been tested for cyclic fatigue under both standard conditions (1 million cycles at 20Hz; load range: 110-320 MPa) only losing 13% of its flexural strength, and extreme conditions (maximum load 1100 MPa), resisting 1 million cycles without failure. The maximum stress loading corresponds to almost double the values obtained with benchmark 3YSZ showing that Innovnano 2YSZ is ideal for structural ceramic applications and an exciting solution when exceptional cyclic fatigue resistance is required.

Our 4 mol-% Yttria Stabilized Zirconia (4YSZ) is much more effective solution for Thermal Barrier Coatings (TBCs) than similar products, consistently demonstrating the lowest thermal conductivity. Independent testing has shown that, after 10 h at 1300 °C, TBCs produced from Innovnano’s 4YSZ demonstrated reduced thermal conductivity when compared to the benchmark, which translates into an approximately 100 °C increase in temperature difference across a 200 µm coating. This means that equivalent surface temperatures can be achieved using a coating thickness that is 30 % less than the benchmark, so parts can be lighter and much more cost-effective in operation.

Innovnano has also used EDS successfully to produce:

* Zirconia/metal matrix composites (cermets) in which the metal coating is evenly and well distributed on the YSZ ceramic surface.
* Monoclinic zirconia powder with enhanced chemical and physical properties, significantly enhancing the performance of refractory materials.

For more information, please visit [www.innovnano-materials.com](http://www.innovnano-materials.com)

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Cyclic fatigue testing for Innovnano 2YSZ

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TBCs produced from Innovnano 4YSZ show a significant reduction in thermal conductivity compared to the Benchmark

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