

**MANUFACTURING OF NANOSIZED YSZ AND
OTHER CERAMIC OXIDES WITH ENHANCED
SINTERING PROPERTIES.**

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Nanoparticles of ceramic materials have a memory similar to larger crystals. They remember the whole history of their manufacturing, including the last highest temperature of their preparation.

The Altair industrial process can produce "high sintering momentum" nanosized YSZ and other oxide materials. Homogeneous distribution of elements through the process allows accomplishing the solid state reaction at temperatures significantly lower than known in the classical solid state reaction process. The crystal lattice of these "low temperature" materials contains significant level of vacancies. The vacancies enhance sintering potential of the nanoparticles. Upon heating at temperatures higher than the highest point during their manufacturing, the preserved sintering momentum in the nanocrystals is released. Nanoparticles start to sinter and they are able to create super dense-low porosity layers or monolithic blocks. The low sintering temperature strategy was successfully applied to manufacture YSZ, ZrO_2 , TiO_2 and other nanomaterials.

Figure 1. Altair Nanosized YSZ is used in applications requiring high sintering properties, for instance high-density SOFC electrolytes.

