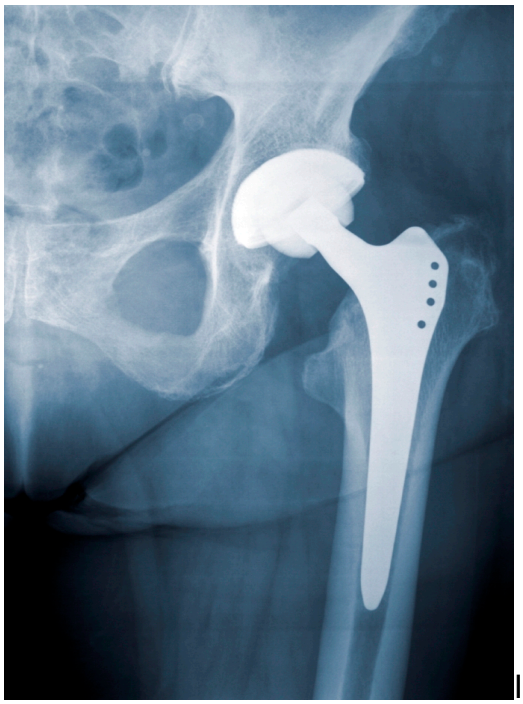
High Performance Ceramic for Increased Life-Span of Orthopedic Implants

MDT Staff



Innovnano has developed 3 mol % yttria stabilised zirconia powder (3YSZ) – an advanced technical ceramic with medical device applications. Thanks to a uniform nanostructure and formation of a high stability phase under pressure, Innovnano's 3YSZ combines extreme component strength and fracture-resistance with enhanced biocompatibility, making it the ideal ceramic material for extended-life orthopedic implants, particularly knee and hip replacements. With advanced mechanical and tribological performance as well as ageing resistance, Innovnano's 3YSZ powder offers an attractive solution to medical implant manufacturers, which, through increased implant lifetime, can offer their customers reduced time, costs and morbidity through fewer repeat, invasive procedures.

Innovnano's 3YSZ is manufactured using the company's patented Emulsion Detonation Synthesis (EDS) technology, producing a highly pure, nanostructured ceramic powder with desirable homogeneity and an even distribution of yttria. Stemming from the powders' nanostructure, the 3YSZ can be sintered at lower temperatures, to keep grain size to a minimum. The resulting high density ceramic provides excellent mechanical performance and exceptional bending strength - an essential property for orthopedic implants which are put under constant mechanical stresses and strains. Furthermore, thanks to the small grain size, the 3YSZ ceramic shows enhanced material stability and, in turn, increased resistance to hydrothermal aging.

For more information, visit: www.innovnano-materials.com [1].

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[1] http://www.innovnano-materials.com