Digimat Material Modeling & Simulation Platform Helping Develop Spinal Disc Replacement

Spinal Implant Company Medicrea Uses Material Modeling Software to Predict Material Performance

SANTA ANA, CA--(October 15, 2013) – e-Xstream engineering, an MSC Software Company, and software developer of Digimat, the leading nonlinear multi-scale material and structure modeling platform for the micromechanical modeling of composite materials and structures, today announced that one of the top innovators in the emerging field of spinal implants is using Digimat to predict the performance of spinal disc replacements.

Digimat is helping European orthopedic products company Medicrea to develop fiber-reinforced plastic composite spinal implants to replace injured or damaged human vertebrae. Unlike most simulation software solutions, which treat all materials like metals, Digimat has micromechanical material simulation capabilities that factor the variability of composite materials into performance calculations. It works with finite element analysis solvers and injection molding analysis data to adjust the material stiffness at every location throughout the spinal implants.

Digimat has enabled Medicrea engineers to make much more accurate predictions of implant performance than possible with previous simulation solutions. Where previous solutions have over-predicted implants' stiffness by as much as 170 percent, Digimat material models have matched physical test results almost perfectly.

“Digimat simulations allow both optimization of production processes and mechanical efficiency of implants,” said Thomas Mosnier, research and development manager, Medicrea. “The simulations will reduce the development process for a range of extension products already planned.”

Composite implants are a relatively recent innovation. In many cases they have supplanted the use of metal spinal disc replacement, which are more difficult to implant and do not offer the same flexibility as composites.

Predicting the long-term performance of composites is more challenging than working with metals, however, because composite behaviors can vary significantly depending on the implant’s shape and the
manufacturing method used to produce it. Shape and manufacturing can alter composite fiber alignment, which can unintentionally increase or decrease stiffness that affects the implant’s performance. Metals, by comparison, are uniformly stiff throughout a part’s shape.

“Composites’ flexibility offers engineers vast new options for designing medical implants,” said Roger Assaker, CEO of e-Xstream engineering and Chief Material Strategist for MSC Software. “Digimat provides them with the material intelligence they need to take maximum advantage of composites to create optimally performing products that improve the quality of life for patients.”

About MSC Software
MSC Software is one of the ten original software companies and the worldwide leader in multidiscipline simulation. As a trusted partner, MSC Software helps companies improve quality, save time, and reduce costs associated with design and test of manufactured products. Academic institutions, researchers, and students employ MSC’s technology to expand individual knowledge as well as expand the horizon of simulation. MSC Software employs 1,100 professionals in 20 countries. For additional information about MSC Software’s products and services, please visit: www.mscsoftware.com

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