

DJO INCORPORATED

Making orthopedic braces more stylish and innovative with SolidWorks software



SolidWorks software is helping DJO Incorporated eliminate the misconception that orthopedic braces are bulky, uncomfortable, and unattractive by making them lighter, more comfortable, and more fashionable.

Whether you are an elite athlete, a weekend warrior, or just a regular guy or gal, the prospect of wearing an orthopedic brace on an injured knee or elbow is often viewed with some degree of trepidation. Orthopedic rehabilitation devices help countless patients recuperate from surgeries and injuries, but braces have long carried the stigma of being bulky, uncomfortable, and unattractive.

As the US leader in the design and manufacture of orthopedic rehabilitation devices, DJO Incorporated is on a mission to make knee braces and other orthopedic products highly functional to address medical need, as well as lighter, more comfortable, and more fashionable. DJO had used a combination of AutoCAD® 2D and Pro/ENGINEER® design tools and until 2002, when the San Diego-based company realized that growing its DONJOY® line of products into the preeminent brand of orthopedic braces would require a better consolidated approach.

According to Robert Bejarano, former NASA engineer and current R&D senior project manager at DJO, creating more fashionable, comfortable braces demands 3D design and simulation capabilities. "Developing braces that are more sleek and stylish—and less medical in appearance—requires the use of better materials and advanced surfacing, visualization, and simulation tools," Bejarano explains. "We need industry-leading 3D design technology that is user-friendly to continue to create first-to-market, cutting-edge, orthopedic products."

DJO transitioned to SolidWorks® 3D design software in 2002 because it is easy to use, is fully integrated with SolidWorks Simulation analysis software, and provides the tools that the company needs to achieve its objectives. The orthopedic manufacturer also values integrated PhotoWorks™ rendering software, which it uses to create photorealistic images of new design concepts.

"We use SolidWorks software for all design, surfacing, rendering, and simulation across our product lines, including rigid bracing, surgical implants, electrical stimulation technology, bone growth systems, and countless other products. It is amazing how versatile this software has been during the development stage," Bejarano says.

Challenge:

Streamline development, improve style, and increase innovation in the design and manufacture of athletic, protective, and orthopedic rehabilitation devices.

Solution:

Implement SolidWorks 3D CAD and SolidWorks Simulation analysis software to cut design cycles, enhance style, and boost innovation.

Results:

- Reduced design cycles by more than 25 percent
- Cut prototyping costs by 5 to 10 percent of project budget
- Introduced first adjustable off-loading knee brace
- Improved premarketing efforts with photorealistic renderings

Designing a breakthrough brace

Since implementing SolidWorks software, DJO has developed a string of first-to-market products. For example, the company made extensive use of SolidWorks software solutions on the TROM Adjuster Post-Operative Brace, a breakthrough knee brace that promotes faster healing following surgery. The first off-loading adjustable brace on the market, the TROM Adjuster facilitates a better healing environment by off-loading weight from injured tissue so that it heals quickly and with less pain to the patient, and reduces the risk of re-injury postsurgically. The product goes beyond traditional postoperative braces, which simply limit range of motion, by combining off-loading adjustable hinge technology with DJO's Tele-Fit telescoping technology to provide a more effective, comfortable fit.

"Most postoperative braces stabilize the knee to limit movement and prevent additional injury during recuperation," Bejarano explains. "With adjustability, we lessen the amount of weight-bearing force on the affected tissues and offload it to the unaffected side, providing pain relief and promoting faster healing at the same time."

Streamlining development

By employing SolidWorks 3D CAD software and SolidWorks Simulation on the development of the TROM Adjuster Post-Operative Brace, DJO not only introduced a next-generation product, but also shortened its design cycle and cut prototype development costs. "Using SolidWorks software, we were at least 25 percent faster designing this device," Bejarano notes.

"We also cut costs related to prototype development by using SolidWorks Simulation," he adds. "SolidWorks Simulation enables us to test parts, optimize material usage, and create a sleek, attractive, and functional design. As a result, we were able to reduce the number of SLS (selective laser sintering) prototypes required for the brace from dozens to just a handful. At an average cost in the thousands for each SLS prototype assembly, SolidWorks Simulation saved us 5 to 10 percent of the project's overall budget by not developing SLS/SLA iterative prototypes."

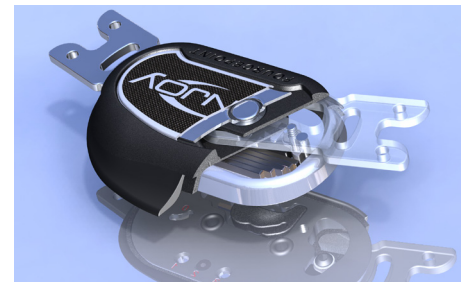
Dominating the industry

The move to SolidWorks software design solutions has paralleled DJO's rise as a dominant player in the orthopedic rehabilitation industry. Today, more than 90 percent of Division 1 college football teams use DJO knee braces, including 61 of the 68 teams in the 2010 round of college bowls. Professional athletes who use DJO braces range from football players—Cincinnati Bengals quarterback Carson Palmer and San Diego Chargers defensive end Shawne Merriman—to extreme surfing world champion Garrett McNamara and a host of alpine, aerial, and mogul skiers.

In addition to creating breakthrough products more efficiently, SolidWorks software solutions help DJO to market its new products more effectively, even before they are in production. With PhotoWorks rendering software, the company can generate marketing literature earlier by using photorealistic renderings to seed the market. "SolidWorks software allows us to create sleek, stylish, and innovative products and present them to the market quicker, which has helped support our growth," Bejarano stresses.

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Robert Bejarano
R&D Senior Project Manager



DJO designs innovative products more quickly with SolidWorks 3D CAD software and saves money by using SolidWorks Simulation to reduce prototyping requirements.



DJO Incorporated
1430 Decision Street
Vista, CA 92081 USA
Phone: +1 760 727 1280
www.djoglobal.com
VAR: Go Engineer, San Diego,
California, USA



Dassault Systèmes
SolidWorks Corp.
300 Baker Avenue
Concord, MA 01742 USA
Phone: 1 800 693 9000
Outside the US: +1 978 371 5011
Email: info@solidworks.com
www.solidworks.com

