DASSAULT SYSTEMES

SOLIDWORKS

CENTER FOR ADVANCED MEDICAL LEARNING AND SIMULATION

CREATING A BETTER FERTILITY DIAGNOSTIC DEVICE

Using SOLIDWORKS design, analysis, mold-filling simulation, product data management, and technical communication software solutions, CAMLS worked with CooperSurgical, Inc. to develop the ABBI™ (Air Bubble Based Infuser). It uses saline infused with air bubbles to provide a better approach for conducting ultrasound exams of the uterine cavity and fallopian tubes to determine potential fertility issues.

CAMLS
Center for Advanced Medical Learning and Simulation

Challenge:
Streamline the design, prototyping, and production of innovative medical devices and equipment.

Solution:
Implement SOLIDWORKS Premium design, SOLIDWORKS Simulation Premium analysis, SOLIDWORKS Flow Simulation computational fluid dynamics (CFD) analysis (including its Electronics Cooling Module), SOLIDWORKS Plastics mold-filling analysis, SOLIDWORKS Enterprise PDM product data management, SOLIDWORKS Sustainability environmental impact assessment, and SOLIDWORKS Composer technical communication software.

Benefits:
- Cut development time by 30 percent
- Accelerated time-to-market
- Improved quality
- Optimized production mold performance

The Center for Advanced Medical Learning and Simulation (CAMLS) is dedicated to inspiring world-class medical education, training, and research that transform the delivery of healthcare services for the benefit of patients. Based in Tampa, Florida, CAMLS operates a 90,000-square-foot, state-of-the-art facility providing every possible form of health-professional education and training, including assistance with research studies and product development.

CAMLS integrates simulation technology, aviation science, team training, and evidence-based best practices into innovative programs with measurable outcomes. The organization's Tampa Bay Research & Innovation Center (TBRIC) collaborates with physicians and medical device manufacturers by combining cutting-edge simulation technologies with research and innovation to move the latest advances in healthcare into practice.

To support its collaborative development programs, CAMLS needed an integrated 3D development platform with extensive design and simulation capabilities, according to Chief Engineer Mario Simoes. "Our mission is to work with physicians and manufacturers to accelerate development of innovative medical devices and procedures," Simoes says. "To achieve our objectives, we need robust yet integrated design and simulation capabilities—ranging from structural and thermal analysis to fluid flow and mold-filling simulation—to streamline the development and accelerate the availability of new diagnostic equipment."

CAMLS turned to Dassault Systèmes SolidWorks Corporation to support its unique development needs because the SOLIDWORKS® family of products offers the software tools that CAMLS needs within the easiest-to-use and most tightly integrated platform. The organization utilizes SOLIDWORKS Premium design, SOLIDWORKS Simulation Premium analysis, SOLIDWORKS Flow Simulation computational fluid dynamics (CFD) analysis (including its Electronics Cooling Module), SOLIDWORKS Plastics mold-filling analysis, SOLIDWORKS Enterprise PDM product data management, SOLIDWORKS Sustainability environmental impact assessment, and SOLIDWORKS Composer™ technical communication software.

"To speed time-to-market, we need to streamline the process for designing, validating, and manufacturing a medical device," Simoes notes. "Because SOLIDWORKS provides a fully integrated suite of design, simulation, data management, and communication tools, we believed it would best enable us to consistently achieve that goal."

"Our injection-mold specialist used SOLIDWORKS Plastics software to determine where the gating locations should be to minimize the appearance of sink marks and knit lines. The simulations also enabled us to understand that by keeping the device in the mold a little longer and at higher pressure, we could contain the sink marks to an acceptable level. SOLIDWORKS tools saved us time while improving quality."

— Mario Simoes, Chief Engineer

COMBINING TWO PROCEDURES INTO ONE

TBRIC used SOLIDWORKS when working with CooperSurgical, Inc. on the development of a new device for conducting sono-hysterosalpingography (sono-HSG), an ultrasound exam for studying the contour of the uterine cavity and the patency of the fallopian tubes to determine potential fertility issues.

"Using SOLIDWORKS, we were able to cut development time by 30 percent," Simoes stresses. "Medical device development takes more time than designing other types of products because we have to validate every step, both in software and through the production of prototypes to support usability studies to comply with U.S. Food and Drug Administration [FDA] requirements. The combination of integrated SOLIDWORKS tools and the ability to conduct testing all within the same facility shortened the process and accelerated time-to-market."

ABBI (Air Bubble Based Infuser) is a single-use device that facilitates two procedures as part of an initial female fertility evaluation: a sono-HSG for tubal patency and an SIS for uterine structure. Both are office-based procedures using existing ultrasound systems and an SIS catheter. These procedures can be performed in an IVF center or OB/GYN practice that offer fertility screening.

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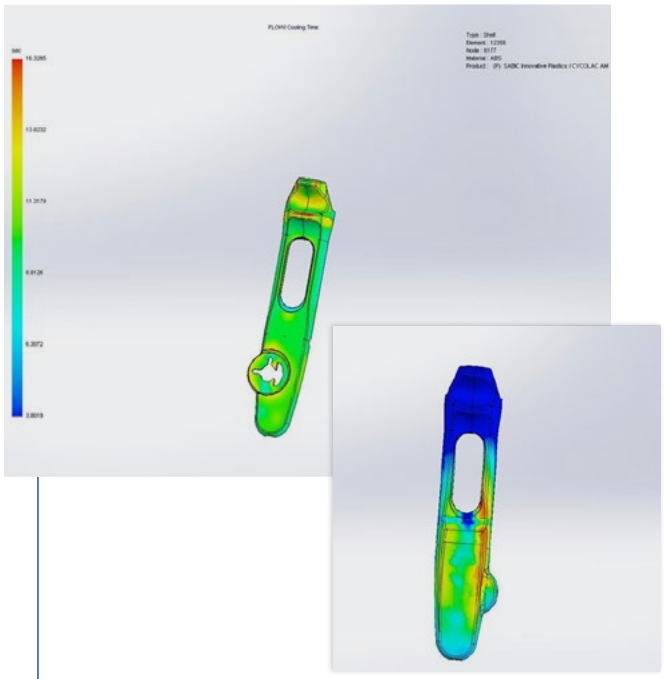

In addition to leveraging SOLIDWORKS modeling software to design the ABBI diagnostic device, CAMLS used other specialized tools, such as SOLIDWORKS Composer technical communication and SOLIDWORKS Plastics mold-filling simulation solutions, to accelerate product development.

SURFACING ADVANCES ERGONOMICS

TBRIC made extensive use of SOLIDWORKS surfacing tools during the development of the sono-HSG ABBI device to refine its ergonomic characteristics. For example, because physician hand sizes vary widely, TBRIC needed to design the device to accommodate different grip positions on the handle.

"We used a lot of surfaces to get the ergonomic shape, produced prototypes for use by doctors, and then utilized the physicians' input to tweak the design to make it more ergonomic," Simoes explains. "SOLIDWORKS surfacing capabilities were more effective and efficient for modifying the surfaces on the handle. With other surfacing packages, modifying one feature means the entire design has to change. Because SOLIDWORKS is parametric, it was faster and easier to modify surfaces in the design."

OPTIMIZING PRODUCTION MOLDS

TBRIC also leveraged SOLIDWORKS tools to improve product quality and manufacturing processes. The team used SOLIDWORKS Plastics mold-filling simulation software to optimize the injection mold for the handle, which is made from a special ABS plastic that deforms under sterilization to ensure single usage of the device.

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