



FAST FACTS: ADVANCED SIMULATION FOR MEDICAL DEVICE DESIGN

Medical device engineers must balance the incredibly difficult tasks of creating innovative, safe, and life-saving products faster than ever while meeting the needs of physicians, patients, and regulatory agencies. SOLIDWORKS®-associative simulation, with a concurrent engineering approach, helps these engineers fulfill industry-specific needs while gaining assurance of product quality, reliability and safety. Here is what you can expect from adding 3DEXPERIENCE® Works and Simulation to your medical device design toolbox:

- 1 Powerful Simulation Capabilities:** Multi-scale and multiphysics features enable you to solve everything, from simple, single events such as dropping an asthma inhaler, to complex, multi-event problems. Access high-performance cloud computing resources to boost power and quickly evaluate medical device designs, while keeping your teams aligned with cloud-based collaboration and data management tools.
- 2 Nonlinear Analysis:** Nonlinear structural analysis is often critical to understanding and improving the performance and safety of medical devices. With a database of more than 350 materials and the ability to easily model complex multi-surface contact interactions, 3DEXPERIENCE Works allows users to validate the performance of medical devices in real-world scenarios with industry-leading Abaqus technology.
- 3 Electromagnetics for Wearables:** As medical devices become increasingly IoT-enabled and deployed for 24/7 monitoring, it is critical to validate a device's electromagnetic performance under all possible operating conditions. Using electromagnetic simulation, you can easily explore and optimize the design and location of the onboard antenna and electronic circuitry to maximize performance and reduce the likelihood of electromagnetic interference.
- 4 Fluid Dynamics and Fluid-Structure Interaction:** Medical devices often incorporate mechanisms to transport fluids, from simple pre-filled syringes to complex peristaltic pumps to administer large-molecule therapeutics for extended durations. Accurately modeling the fluid velocities and pressures is critical to understanding and optimizing the drug delivery process. It is also important to understand the effect of the fluid on the surrounding structures to minimize leakage and enhance durability.
- 5 SOLIDWORKS Integration Workflow:** Associativity with SOLIDWORKS means no export/import rework—giving SOLIDWORKS users the most streamlined, user-friendly simulation workflow possible.



"I have a ballpark idea of how our designs will work, but how do I make it right the first time? Simulation lets us test our work so we can be right out of the gate. When we go to do our testing and verification, it needs to be a check-the-box exercise. We cannot find surprises right before we launch. 3DEXPERIENCE Works Simulation removes this uncertainty and helps us push the envelope with our products. I'm very impressed with its capabilities."

— Dr. Joseph Lacey, Principal Engineer, GE Healthcare



"Clinical trials are very expensive, take months, and are a difficult way to analyze the causes of product problems. For this reason, we adopted 3DEXPERIENCE Works Simulation. We were able to perform advanced simulation, nonlinear dynamic analysis, multistep analysis, and many other simulation techniques at a very reasonable price. A great advantage was being able to use existing data created by SOLIDWORKS. With all data connected, our workflows are dramatically improved by 3DEXPERIENCE Works Simulation."

— In-Hyuk Heo, Researcher, TiNiKo