

Medtronic ENT Noses Ahead of Competition with Pro/ENGINEER® Wildfire™

Medical Device Manufacturer Gains Speed, Streamlines Processes

Medtronic ENT, Jacksonville, Florida

Every six seconds somewhere in the world, a life is saved or improved by a Medtronic product or therapy. A global leader in medical technology, Medtronic, Inc. started out in 1944 researching ideas to help treat heart disease. Today, the company offers a wide range of therapies and products—from medical sponges to life-saving defibrillators.

Nearly 32,000 people worldwide work for Medtronic, including its Medtronic ENT division, a leading developer of products to treat diseases of the ear, nose and throat (ENT). Medtronic ENT designs and manufactures powered tissue-removal systems and other microendoscopy instruments, implantable devices, nerve monitoring systems, disposable fluid-control products, image-guided surgery systems, and a Ménière's treatment device.

The Challenge: Staying Ahead of the Pack

With so many different offerings, Medtronic competes with a wide variety of companies on almost every product—and the competition is fierce. “You can’t sit on your hands and let a competitor get in front of you,” says Joel Hembrock, Senior Designer and CAD Administrator, Medtronic ENT. Not only does the company have to be first to market, it must constantly update its tools to attract the tough-to-please surgeons who use them. Medtronic ENT must create tools with refined ergonomic features and high performance capabilities without delay, or risk losing market share to a competitor.

The Solution: Better Surfacing with Pro/ENGINEER Wildfire

With their previous AutoCAD environment, Medtronic ENT found it almost impossible to make external shape changes at the end of the design cycle. After they began using Pro/ENGINEER Wildfire, the team not only could make these changes, but also complete them in just a matter of hours. What’s more, the surfacing tools allowed the design team to include more curves than ever before, ensuring their products had the precise control and “cool factor” surgeons demanded.

The Result: Cutting-edge, Ergonomic Medical Tools

Pro/ENGINEER played an important role in Medtronic ENT’s development of the Straightshot M4 Microdebrider, a specialized tool that offers surgeons a curved, rotatable blade for easier access to the frontal and maxillary sinus to remove polyps, bone, and diseased mucosa. Medtronic, who partnered with Metaphase Design Group, is the only ENT company to offer a device with a curved blade with rotatable cutting tip, thus sealing the company’s reputation as a medical device leader in the ENT field.



The Straightshot M4 Microdebrider is a specialized tool that offers surgeons a curved, rotatable blade for easier access to the frontal and maxillary sinus to remove polyps, bone, and diseased mucosa.

“Now, with Pro/ENGINEER Wildfire, we don’t have to settle for a less ideal design.”

–Joel Hembrock,
Senior Designer and CAD Administrator,
Medtronic ENT

Looks Matter

Until recently Medtronic ENT used a less-robust CAD system to design its products, but the process was time-consuming because of frequent system crashes and capability limitations. In 2001, the company implemented Pro/ENGINEER, and in 2005 moved up to Pro/ENGINEER Wildfire 2.0.

Medtronic was immediately impressed with the improved intuitive selections and visual commands available. These improvements made it easier to design highly functional and visually appealing tools, which in turn ensured the tools had the “wow” factor the surgeons clamored for.

“The interface in Pro/ENGINEER Wildfire improved dramatically,” explains Joel Hembrook. “You can just select objects from the screen and then enter a command. I never want to go back—this is so much easier.” That’s because the feedback is visual—you see the feature as you are creating it. User-friendly tools include graying out areas you can’t work on, previewing how the design will look, and check-marking completed commands. Plus, only the commands that are available are visible for selection. All of these built-in features allow the team to double-check the design much sooner in the process, avoiding costly mistakes.

“The dashboard feature with Pro/ENGINEER Wildfire constantly gives you visual feedback,” says Chip Perry, Advanced Designer, Medtronic. Adds Ron Graves, Advanced Designer, Medtronic: “It’s a lot quicker to crank out drawings.”

On the Surface

When it comes to designing intricate medical tools, creating smooth, circular edges is critical. Thankfully, the surfacing functions in Pro/ENGINEER are more user-friendly than ever.

“Before, we used to run everything off the curves,” explains Hembrook. “Now, with Pro/ENGINEER Wildfire, we use those surfaces to control other features.”

Now with digital model data that’s more accurate, the design team is better able to push the envelope, creating sleeker, more curved medical devices.

In addition to Pro/ENGINEER CAD tools, Medtronic implemented Pro/INTRALINK®, a PTC tool for managing Pro/ENGINEER data, which allows the team to always access the latest files, so nothing gets lost. The team doesn’t have to worry about updating old files or working from files with incorrect calculations. “You can’t put a price tag on what that saves,” raves Hembrook.

Need for Speed

Another reason the Medtronic team is able to design so quickly is Pro/ENGINEER Structural and Thermal simulation, which allows the design team to virtually test the product in actual working conditions, leading to higher-quality products.



Surfacing functions in Pro/ENGINEER have aided in designing the smooth, circular edges that are critical to the design of intricate medical tools like the Straightshot M4 Microdebride.

“While using the other CAD system...one of our suppliers used to take our medical parts and remodel them in Pro/ENGINEER themselves because they felt our models were unreliable,” explains Chip Perry. “Not anymore.” And when clients and colleagues ask him how he likes working with PTC, the answer is a no-brainer:

“One of the best things about using Pro/ENGINEER is the support, both on the technical and sales side,” Joel explains. “The person with the right information calls you back immediately—within half an hour, at the most.” The PTC Web site has also proven to be a time-saving support tool.

“The Web site doesn’t just give information—it’s an actual tool you can use,” he explains. “Menu Mapper, for instance, is very handy for looking up commands, and the tutorials are tremendous.”

Looking ahead, Medtronic ENT hopes to build on its success by connecting Pro/ENGINEER Wildfire to its Enterprise Resource Planning (ERP) system, billing system, and suppliers, saving even more time in its quest to remain the leading developer of ENT products.

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