

Micus AB

INNOVATING A MOBILE INTENSIVE-CARE TRANSPORTATION SYSTEM WITH SOLIDWORKS



Using SolidWorks, Micus AB developed the MICU stretcher's innovative aluminum and carbon-fiber design.

- Compressed design cycles
- Reduced development costs
- Enhanced product quality
- Improved design communications

Micus AB pioneered the market for mobile intensive-care transportation systems through its introduction of the Mobile Intensive Care Unit (MICU) stretcher, which provides the primary capabilities of a medical intensive-care unit for transporting intensive care patients via helicopters, aircraft, and ambulances. After filling its initial order from the National Swedish Air Medevac Service for six intensive-care stretchers, company management decided in 2005 to bring in-house the product design function, which consultants had carried out previously, according to Mats Lindfors, technical manager.

Lindfors first served as a consultant on the initial development of the MICU stretcher. Upon joining the company, he faced the decision of choosing a 3D CAD system that would sustain and advance ongoing development of this innovative product. Fortunately, Lindfors had completed an evaluation of available 3D CAD systems for a previous employer before consulting on the MICU project. "We needed a CAD system that was user-friendly for modeling components and assemblies, and that supported quick, easy design changes," Lindfors recalls. "Plus, we needed product data management (PDM) capabilities to ensure good control of revisions and to manage data access and security."

Before joining Micus AB, Lindfors had evaluated several 3D CAD packages, including I-DEAS®, Mechanical Desktop®, Pro/ENGINEER®, and SolidWorks® software. After first using SolidWorks for consulting, he chose SolidWorks CAD software as the standard package at Micus AB because of its ease of use and broad functionality, including assembly, configurations, and sheet-metal design capabilities. Micus AB also valued the ability to implement integrated SolidWorks Enterprise PDM software as well as compatibility with Microsoft® Office products.

"SolidWorks was simply the most cost-effective solution, providing the best combination of functionality, compatibility, and performance for the price," explains Lindfors.

“We definitely saved time and shortened our design cycle by using SolidWorks software, primarily because it allows us to make design changes faster and easier.”

Mats Lindfors, Technical Manager



Micus AB relied heavily on SolidWorks visualization tools for developing the MICU stretcher and showing emergency transport personnel how the stretcher operates.

Fast model creation, quick design changes

Implementing SolidWorks 3D CAD software at Micus AB resulted in quick model creation, fast design modifications, and compressed design cycles. In addition to developing the MICU stretcher's innovative aluminum and carbon-fiber design, the company had to model several systems and components provided by OEM partners. These included oxygen cylinders from Avox Systems, a ventilator from Dräger Medical, and a defibrillator from Zoll Medical Corporation, as well as a suction pump from Laerdal Medical AS, an automated medical infusion system from Alaris Products, and the stretcher-to-aircraft interface from LifePort, Inc.

“As the sole designer in the company, I must be able to create models quickly and make design changes and updates efficiently,” Lindfors notes. “We definitely saved time and shortened our design cycle by using SolidWorks software, primarily because it allows us to make design changes faster and easier.”

Bending aluminum with sheet-metal capabilities

One of the major challenges of the MICU stretcher design was to develop a stretcher chassis light enough for transport, yet strong enough to meet safety standards for use in ambulances and aircraft. To meet this significant demand, Micus AB used SolidWorks sheet-metal design capabilities to support the aluminum-bending and fabrication processes required for manufacturing.

“We used sheet-metal design capabilities heavily in our initial development of the MICU stretcher and continue to utilize SolidWorks sheet-metal functionality to drive fabrication processes and control development costs,” Lindfors stresses. “SolidWorks design data is very compatible with manufacturing partners. For example, we export drawings and DXF™ files for making the laser cuts on the unfolded pieces of sheet metal in the process of producing the MICU chassis.”

Visualization aids assembly development

Because the MICU stretcher is a sophisticated product, SolidWorks visualization tools were vital not only for developing and assembling the stretcher's variety of systems and components, but also for showing how the product operates to potential customers and emergency transport personnel. Micus AB used large-assembly visualization tools, such as collision detection capabilities, for identifying potential part interferences, and design configuration capabilities for showing the MICU stretcher in different modes of deployment.

“The MICU stretcher is a complicated product, and it's expensive and time-consuming to make a prototype,” Lindfors points out. “Using a single SolidWorks model, we easily made configurations to show how the stretcher operates with handles pushed out, with the wheels up or down, or with the base carbon-fiber stretcher removed. The ability to visualize the product fully – such as using assemblies and mates to see how the pieces fit together geometrically or using SolidWorks eDrawings® files for fast, convenient design communication with partners, customers, and regulators – improved the quality of our product.”

“Without SolidWorks, it would be almost impossible for us to design this product that has to fulfill both the regulatory requirements from the aerospace industry and regulatory agencies as well as from the medical technology industry,” Micus President Torsten Käll says.



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