

A-dec, Inc.

Customer Success Story

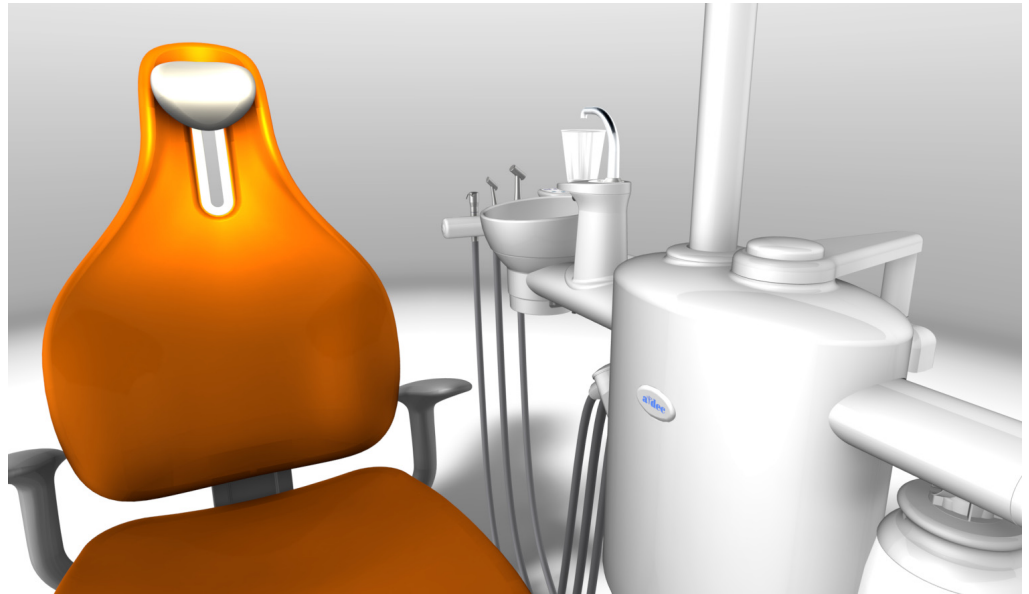
Autodesk® Inventor®
Autodesk® Vault
Autodesk® Algor® Simulation

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—Patrick Berry
Staff Engineer
Product Development
A-dec, Inc.

Innovating dentistry.

A-dec revolutionizes dental equipment solutions using the Autodesk solution for Digital Prototyping.



Project Summary

A-dec Inc.'s award-winning dental equipment can be found in the White House, ships at sea, more than 100 countries, and 90 percent of dental schools throughout the United States and Canada. Founded in 1964, the family-owned, Oregon-based company is one of the world's leading dental equipment providers and a one-stop shop for cutting-edge, configured-to-order dental equipment systems. From the company's diverse product catalog, customers can configure seamlessly integrated, high-quality equipment for any dental practice.

Passionately committed to quality and reliability, A-dec builds each product from the ground up. The company controls quality at every level of production—even manufacturing the base components for its products, such as tubing for air and fluids, to reach the high standards for which A-dec is known. To design new products and help ensure all parts operate smoothly within a dental system, the company relies on Autodesk® Inventor® software and Digital Prototyping. With Digital Prototyping, A-dec is able to:

- Validate product designs prior to physical prototyping
- Integrate system components easily with the use of assembly simulations
- Cut time to market significantly

The Challenge

A-dec's vast product offerings include dental chairs, lights, stools, sterilization systems, delivery systems for air and fluids, sets of hand tools, and almost everything else dentists need to outfit their patient rooms. A-dec engineers developing new products must consider a host of design challenges and quality requirements ranging from dentist ergonomics and patient comfort to federal regulations on hygiene and structural product safety. Additionally, each product must function independently and seamlessly within a variety of configurations.

"Our catalog contains such a diverse variety of products and each item can be configured in so many ways," says Joel Smith, engineering manager at A-dec. "Designing new parts to work flawlessly and simply within both new and existing systems is a complex undertaking."

A-dec also strives to make products easy to use and service throughout their long life span. The company drives this mandate by engineering products with the fewest number of serviceable parts possible and reusing common components in new designs. "Our engineers are constantly challenged to create better, higher-quality products using as many common parts from our existing products as possible," says Paula Vogel, communications and public relations manager at A-dec.

Autodesk®

With help from Digital Prototyping, A-dec delivers award-winning innovation and quality while saving time and money.

The Solution

A-dec engineers tackle the variety of design challenges they face by building complex digital prototypes with Autodesk Inventor software. Digital Prototyping allows A-dec engineers to identify potential quality concerns early in the design process, saving costly cycles of physical prototyping.

"The digital prototype is our primary design tool," says Patrick Berry, staff engineer in product development at A-dec. "With Inventor software, we can integrate everything in one place and see a complete prototype before anything is built. We're getting to a more perfect physical prototype much faster."

Simulating Dynamic Assemblies

Using Inventor software, engineers can bring innovative ideas to life in a 3D model. And given the complex and integrative nature of A-dec's dental equipment, Inventor helps engineers quickly determine whether and how one product will work within the greater equipment system. For example, before a single part is manufactured, engineers can look at digital prototypes of entire assemblies and systems to help ensure all parts connect and move smoothly.

"Our products are physical and kinetic in nature and operate in high-traffic, hands-on environments," explains Berry. "Our chairs have flexible arms that move. The overhead light and delivery systems attach to the chair at different points. We constantly rely on the interference analysis and clash detection capabilities in Inventor software to make sure there are no potential collisions."

Autodesk Inventor also helps A-dec meet a variety of federal medical and structural regulatory requirements. "With simulation tools, we can assess whether a design addresses regulatory mandates for impact and loading in the initial phases of design," Berry says. "By the time we build our first physical

prototype, we're confident it will comply with the range of regulatory standards."

Driving New Ideas

A-dec engineers continually tweak part designs within larger, complex product assemblies to create new, innovative designs. Autodesk Inventor makes this iterative design process easier, thanks to its parametric modeling capabilities. "Inventor lets us maintain relationships between the parts of the digital prototype," explains Berry. "We can iterate easily, without starting from scratch. When we have changes to one part, Inventor automatically updates the entire assembly. That makes taking designs to the next level that much easier."

Easier Collaboration with Vault

When developing a new product, as many as 25 A-dec engineers work concurrently, designing parts that must ultimately interconnect. In the past, the lack of version control was a huge issue, resulting in wasted time and effort. Now, A-dec relies on Autodesk® Vault software to manage all data related to the digital prototype—letting engineers know they're always designing and building interfaces around the most up-to-date parts. "Life before Vault was cumbersome," says Berry. "Thanks to Vault, engineers know they're not working with something that was obsolete months ago. The team can collaborate with confidence."

Autodesk Vault software also makes it possible for stakeholders in different departments and locations to leverage the digital prototype and its built-in information. External vendors use the digital model to create tools and cast parts. Manufacturing relies on the geometry in the digital prototype to produce and assemble the product. And the marketing department uses the digital prototype to create advertising materials, installation instructions, and service guides. Smith notes: "Beyond its direct design use, the information contained in the digital



prototype helps a long list of others do their jobs more efficiently."

Greater Insight with Algor Simulation

A-dec also relies on Autodesk® Algor® Simulation software to study the complex hydraulic and pneumatic systems in its products—providing another example of A-dec's commitment to quality and excellence. "The fluids groups are improving product designs using Algor Simulation," says Berry. "Now we can conduct thermal simulations in-house, which helps us speed design times, lower costs, and raise the quality of our designs even more."

The Result

With the help of Digital Prototyping software from Autodesk, A-dec is able to save time and money in the design phase, while still delivering award-winning innovation and quality. "If we were doing this by hand, our development cycle would be much longer," says Berry. "For us, Digital Prototyping isn't a bonus—it's a requirement for providing the innovative, high-quality equipment our customers expect."

For More Information

To find out how Autodesk and Digital Prototyping can help boost innovation and speed design times, visit www.autodesk.com/medicaldevices.



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