

# DEW Engineering and Development Limited

Autodesk Manufacturing Solutions  
Customer Success Story

Autodesk® Inventor™ Professional  
Autodesk® Vault  
AutoCAD® Electrical



*“Everything is linked to the Inventor model: our publication illustrations, our training illustrations, and our manufacturing operations. This means that when we send out our publications and training material with our products, we know categorically that they are correct as designed.”*

Ken Jones  
Vice President Engineering and  
Defense Programs  
DEW Engineering and Development Limited

## DEW Builds World’s First DoubleDock™ Aircraft Passenger Boarding System Using Autodesk Manufacturing Solution

Autodesk Inventor Professional and Autodesk Vault drive DEW’s innovative designs and facilitate the company’s delivery of integrated logistics support

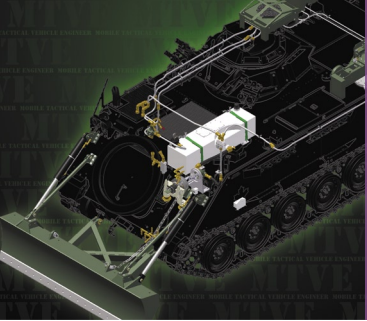
### Project Summary

A private Canadian company established in 1978, DEW Engineering and Development Limited (DEW) designs, tests, evaluates, prototypes, and manufactures defense, armor, and airport systems. The company generates more than \$100 million a year in revenues, building products such as major vehicle equipment for the Canadian Army, armor for wheeled and tracked military vehicles in Canada and the U.S., over-the-wing (OTW) passenger boarding bridges, and, most recently, the world’s first fully automated DoubleDock™ aircraft passenger boarding system. Using Autodesk® Inventor™ Professional, DEW creates 3D designs and ties them to product lifecycle support deliverables, including training materials, user manuals, and other publications. As a result of adopting Autodesk Inventor, DEW has been able to speed up its design cycle,

reduce errors, and enhance control over its design process. The company has also achieved significant benefits by deploying Autodesk® Vault. With Vault, DEW’s engineers, designers, and illustrators can now collaborate on design work without risking version problems and other errors that can result from ineffective design work-in-progress management. To produce electrical schematics, DEW uses AutoCAD® Electrical. Thanks to its Autodesk manufacturing solution, DEW has been able to:

- Reduce prototype development time by 50%
- Cut data management time by nearly 85%
- Produce all product lifecycle deliverables from a single model
- Secure one of the first ISO 9001:2000 certifications for the development and publishing of electronic technical publications

Autodesk®



*"We're driving down costs and getting products out quicker than ever. Inventor has certainly increased our competitiveness."*

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### **The Challenge: Supporting The Entire Product Lifecycle**

DEW serves sophisticated customers with complex systems. These customers expect DEW to deliver high-quality, innovative products, and all the publications, training, training materials, spare parts, and provisioning needed to support the products. Providing this integrated logistics support was challenging before DEW standardized on a single software solution. Explains Ken Jones, vice president engineering and defense programs for DEW, "Each engineer would decide what solution they wanted to use, and there were several in use throughout the organization. As a result, we had insufficient control over our design efforts. Additionally, none of the software supported our other deliverables. We needed a tool that would not only allow us to produce the 2D drawings for manufacturing and procurement, but would also provide illustration outputs we could use to meet documentation requirements."

DEW's goal was to find a manufacturing solution that could solve these problems while making it easier to deliver first-to-market products. "We are focused on being innovative," says Jones. "Each of our products is unique. But we don't want to end up with unsupported—or orphan—products. Everything we develop must be supportable for the life of our products."

Having a manufacturing solution in place that would control and speed up its design process in the midst of innovation was tantamount. One area DEW wanted to improve was its ability to change designs quickly. Before Autodesk Inventor, making a change to one area of a design was a potential recipe for errors. "We're dealing with very complex systems, and when each part of that system is designed with a different tool, there's no way to quickly ascertain the impact a design change on one part will have on another," says Jones. "As a result, we had too many errors—errors that would have been preventable if we had a single, integrated, parametric model."

### **The Solution: Autodesk Inventor Model Is Hub for Innovation**

Working closely with an Autodesk reseller and Autodesk Canada, DEW has transformed its design and logistic support processes with its Autodesk manufacturing solution. Autodesk Inventor drives the company's entire creative process, including its research and development (R&D) efforts. By using the software in the early stages of R&D, DEW speeds up the downstream design process. "R&D creates an Inventor model and then updates it to reflect the results of prototyping," says Jones. "That way, we already have a model that's ready to go into production."

This same 3D model is leveraged in all other customer deliverables. "We are one of the few companies with an integrated systems engineering environment," explains Jones. "Everything is linked to the Inventor model: our publication illustrations, our training materials, and our manufacturing operations."

When there is a change to the Autodesk Inventor model, all of our logistical support document for the product automatically updates. "We've been very successful at streamlining our change process with Autodesk Inventor," adds Jones. "We no longer have to worry if our spare parts lists, modification kits, upgrade packages, technical manuals, or drawing packages contain fully accurate information. Because the Inventor model is the hub for all of our design and documentation efforts, we know that all changes are instantaneously reflected in all materials."

The efficiencies DEW is realizing in its digital product development process translate directly into competitive advantage. Recently, the company designed and deployed a fully automated double-docking boarding system for the Denver, Colorado airport—the first of its kind. The system has a huge impact on airport operations, as it allows for quicker boarding and deplaning of passengers, and thus makes it easier for the airlines to meet departure times, increase

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the proportion of lying time at the gate, service more flights per day, and increase customer satisfaction. The company took the product from early concept to deployed product on an impressive timeline. “When you consider the implications of what we’ve delivered—a fully-automated front and rear boarding system—it’s really remarkable. Inventor helps us achieve this innovation, and do it as efficiently as possible,” says Jones. “We’re driving down costs and getting products out quicker than ever. Inventor has certainly increased our competitiveness.”

## Speeding the Manufacturing Process

Not only is Autodesk Inventor streamlining the creation of original designs, it is also enabling DEW to manufacture products at a faster pace. In the past, the company had to redraw the geometry of parts in the programming language the shop floor machines used. Now, manufacturing takes the geometry directly from the Autodesk Inventor model, so there’s no manual redrawing. “The potential for errors has been eliminated,” says Mike Connelly, engineering manager at DEW.

Automated bills of materials (BOMs) have also helped to decrease errors that once slowed the manufacturing process. Before implementing Autodesk Inventor, designers generated their own BOMs. When a design changed, there was no way to tell whether the BOM was also updated. “Our manufacturing process was slowed because we’d end up ordering too much, not enough, or the wrong part,” explains Connelly. “For example, if the thickness of the material on a design was altered, but someone forgot to change the BOM, procurement ordered the wrong material. Inventor has minimized these errors and thus sped up the manufacturing process.”

Now, instead of wasting time correcting errors associated with manually-created BOMs, DEW’s design team collaborates with manufacturing and field people on how to improve the product. “Instead of focusing on fixing the original design,

we can focus on making the design better,” says Connelly. Errors have also been reduced with the use of AutoCAD Electrical, which automates key control systems design tasks. Rather than manually laying out electrical schematics, which could introduce errors, DEW can use AutoCAD Electrical to design and modify electrical controls faster and more accurately than before.

## Streamlining Reviews

Designing in 3D with Autodesk Inventor has transformed DEW’s design review process as well, aligning it more closely with the company’s goal of supporting innovation. In the past, reviews were centered on questions about the design’s viability. Today, reviews focus on enhancing the design. Explains Connelly, “We used to depend on drawings that weren’t always to scale and limited in their views. We spent a lot of time answering questions such as, ‘What about clearances?’ and ‘Do these parts work together?’ With Inventor’s parametric model, those kinds of questions go away. Now we sit around a computer, rotate parts, zoom in, and make changes that actually improve the design.”

## Managing Data More Effectively

DEW’s design team would find it difficult to collaborate effectively on work before implementing Autodesk Inventor and Autodesk Vault. A supervisor managed design data, tracking what pieces individuals and teams worked on manually—an extremely labor-intensive process that sometimes failed to prevent two team engineers from impacting the same part independently. When there was a design change, the supervisor had to make certain that the drawings being pulled were in fact the correct versions, a far from fail-safe process that without additional effort and cross-checking could have led to errors.

Autodesk Vault provides easy-to-use work-in-progress data management, enabling DEW to automate its once manual data management tasks. Designers check out drawings to make

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*DEW's decision to use Autodesk was based in part on the strong user community and the company's ability to impact Autodesk product development. "We knew that we could give our input and that an Autodesk product downstream would deliver what we needed," says Ken Jones, vice president engineering and defense programs for DEW. "Our data was sent to Autodesk R&D on numerous occasions. We've put a lot into our relationship with Autodesk—more than we have with any other vendor—and it has served us very well."*

changes and then check them back in when they are finished. This prevents team members from altering a design that someone else might be working on. "With Inventor and Vault, if someone is working on something, the rest of the team knows it," says Slavin Raychev, CAD administrator for DEW. "We finally have collaboration under control."

Meeting requirements for integrated logistic support has also been made easier with Autodesk Vault. DEW has to look holistically at every product, whether or not the company manufactured all its parts. "For every product, we ask: 'What do we need in our model to support training, publication, and provisioning deliverables?'" explains Jones. "We may have to reference commercial parts in the maintenance manual, for example. With Autodesk, we can easily manage all of this data—and reuse it when it's time to complete the illustrations for publications." Autodesk Vault allows DEW to assign different team members with various levels of access to ensure the integrity of the Autodesk Inventor models. While only the engineers can edit designs, technical writers can access them to get the information they need for documentation.

Implementing a data management system made it possible for DEW to receive its ISO 9001:2000 accreditation for technical publications development and publishing. "Although we were already accredited for our engineering and manufacturing operations, getting accredited for the publications was vitally important to us," says Jones. "Our customers take it for granted that our products will function, be delivered on time, and include publications, training, and revisioning support. That forces us to concurrently develop products and

their lifecycle deliverables. With Vault, we have all of our documentation under control, allowing us to become one of the first companies in North America to receive ISO 9001:2000 certification for electronic technical publications."

### **The Results: Saving Time, Reducing Errors, Achieving First to Market**

By using Autodesk Inventor to create designs and Autodesk Vault to manage design data, DEW has enjoyed a leap in productivity. All product lifecycle deliverables are generated from a single model, speeding their development and ensuring accuracy. The 3D models also enable DEW to produce more accurate designs with fewer errors. In many cases, DEW can even take the model given to them by the customer as a starting point for its designs. "Especially with our vehicle work and add-on armor kits, when we work with a STEP file or model given to us by an outside OEM, we eliminate a large amount of time measuring and producing templates," notes Jones. "We can thus get to market faster with a more accurate product."

With its more precise designs, DEW has slashed prototype work by 50% and eliminated the data management issues that once plagued the company. While it used to take one and a half full-time supervisors to manage design data, it now takes just a quarter of one employee's time—a reduction of about 85%.

Concludes Jones, "From providing integrated logistics support to delivering first-to-market products efficiently and cost effectively, our Autodesk solution has played a crucial role in helping us to meet our business objectives."