

We chose Autodesk software because we believed it helps support high quality, creativity, and innovation. With the help of Inventor and Vault Manufacturing software, we are delivering projects in the American tradition of fine woodcraft for the most exacting clients in the U.S.

—Michael Reilly  
President  
Reilly Windows & Doors

# Exquisite openings.

Reilly Windows & Doors impresses clients with innovative designs and extraordinary craftsmanship.



## Project Summary

When you're building one of the largest and finest residences in the United States, you expect every detail to be perfect, beautiful, and unique. That includes distinctive windows and doors that meet the home's functional needs while enhancing its overall design. Known for its innovation and quality craftsmanship, Reilly Windows & Doors designs, fabricates, and installs custom windows and doors that exceed the expectations of even the most exacting clients. To create products that are at the leading edge of elegance and quality, Reilly Windows & Doors relies on a Digital Prototyping workflow based on Autodesk® Inventor® Professional software to design, visualize, and simulate its products digitally. With Inventor software, the company can also repurpose manufacturing models of its products for architects who use Autodesk® Revit® Architecture building information modeling (BIM) software. For design reuse and data management, Reilly Windows & Doors utilizes Autodesk® Vault Manufacturing software. Autodesk software has helped Reilly Windows & Doors to:

- Design and manufacture completely unique products for demanding clients
- Speed design time by reusing and customizing existing designs
- Improve collaboration and offer ever higher levels of service to architectural clients by integrating into the BIM process

## The Challenge

The products created by Reilly Windows & Doors are not only innovative, they defy simple categorization. "A window might also serve as a door, or a door as a wall," says Michael Reilly, president of

Reilly Windows & Doors. "Our products also tend to be mechanically complex, such as a 15-foot window that drops into a basement or a curved unit that slides into a wall."

These unique window and door designs need to interface seamlessly with their intended homes. "We must be able to visualize how our products will function and then quickly make changes to the design if needed," says Reilly. "Products must meet the exacting expectations of very creative architects."

## The Solution

To help it visualize its designs more fully, automate time-consuming manual tasks, and satisfy its clients, Reilly Windows & Doors has moved beyond 3D to Digital Prototyping. Using Autodesk Inventor software, the company develops digital prototypes of its designs, assessing design options without relying on physical prototypes. What's more, engineering and design occur simultaneously, which helps speed product development.

"In Inventor, we can constrain our 3D models with motion to find out what's going to work," says Paul Osheske, a design engineer at Reilly Windows & Doors. "At the same time, we can continually modify them to get the precise look and feel the architect wants to achieve."

In addition, designers can make changes quickly to the digital models, giving the company the flexibility it needs to polish designs. "In the past, we had to redo drawings and the manufacturing documentation when we made even a small change

# Fine American woodcraft lives on in the innovative products Reilly Windows & Doors builds using Autodesk software.

to the design,” says Brian Goodale, vice president of operations at Reilly Windows & Doors. “Now, because it’s so much simpler to make changes to our digital prototypes, we can finesse them up to the last minute.”

## Detecting Problems with Motion Simulation

The ability to simulate motion and detect conflicts between parts of its digital prototypes recently helped Reilly Windows & Doors design innovative hardware for sliding walls. “Our client was looking for monumental doors that also acted as windows and external walls,” says Reilly. Realizing that no off-the-shelf hardware would be able to meet the design parameters and carry the weight of the units, Reilly Windows & Doors designed custom rollers.

“Inventor allowed us to model the unit and identify conflicts and other issues,” continues Reilly. “We found out, for example, that our original design might have had water and air infiltration problems. Thanks to Digital Prototyping, we were able to find and fix the problems well before fabrication.”

## Reusing Designs Cuts Design Time

While detecting problems early is a huge advantage, Reilly Windows & Doors points to design reuse as having an even bigger impact on its product development process. Autodesk Vault Manufacturing lets the company reuse designs. “A typical home requires windows and doors that vary in shape and size, yet stay true to the look we’ve designed,” explains Christian Sampedro, production engineer at Reilly Windows & Doors. “With Vault, we can use the same model to create every window and door in a home. We simply copy our design, alter the dimensions, and have a new model in minutes.”

## Speeding the Documentation Process

Regardless of whether the design process starts with a blank sheet or an existing model, Reilly Windows & Doors must mill every piece of fine wood to

a different size and profile—making detailed, accurate cut lists essential. Reilly Windows & Doors used to manually account for each individual wood piece and hardware item called for in the design to create its cut lists and bills of material, which was highly time consuming and error prone. Now the process is completely automated. “Our Inventor models have a lot of built-in intelligence,” Sampedro says. “Now when we release a project to manufacturing now, we not only have an accurate, automatically generated cut list, we have a model that our CNC machines can read without human intervention.”

## Connecting to BIM

The windows and doors that Reilly Windows & Doors manufactures are undeniably beautiful, meeting the high standards of its clientele. But what sets the company apart from its competitors is its unrelenting inventive drive. “We aim to create the most innovative designs, adopt the most efficient production processes, and own the best machinery,” says Reilly. “Our innovation extends even to the services we offer.”

To that end, the company is one of the first custom window and door manufacturers to deliver models to architects using building information modeling (BIM). BIM is an integrated process that allows architects, owners, and contractors to explore a project’s key physical and functional characteristics digitally—before it’s built. On a residential home project that takes advantage of BIM, information is coordinated and consistent, fueling efficiencies throughout the project lifecycle.

By delivering 3D models to architects, Reilly Windows & Doors can help architects build richer architectural models, communicate more effectively with owners, and more accurately explore the project before finalizing the design. “It’s a huge value, particularly because most architects can’t spend time creating realistic models of windows and doors,”



says Michael John Iwanyczko, director of marketing at Reilly Windows & Doors. “We’re offering them highly detailed 3D models that they can incorporate into their architectural designs—it’s another level of service that sets us apart.”

## The Result

Not only has Reilly Windows & Doors extended its competitive lead with help from Autodesk software, it’s realizing other concrete benefits, too. Design reuse has cut down design time on some projects by as much as 90 percent, and the automatic generation of cut lists has drastically reduced the time and effort spent on error-prone manual processes. Reilly sums up Autodesk’s impact on the company this way: “We chose Autodesk software because we believed it helps support high quality, creativity, and innovation. With the help of Inventor and Vault Manufacturing software, we are delivering projects in the American tradition of fine woodcraft for the most exacting clients in the U.S.”

## For More Information

To learn how Autodesk Inventor software and Digital Prototyping can help you design, visualize, and simulate products—and reduce your reliance on physical prototypes—visit [www.autodesk.com/inventor](http://www.autodesk.com/inventor).

To learn more about Reilly Windows & Doors, visit [www.reillywd.com](http://www.reillywd.com).



The support from our Autodesk Authorized Reseller, Widom Associates, has been essential. They always attend to our technical needs, provide us with alternative solutions, and help us steer our Autodesk software implementation projects in the right direction.

—Christian Sampedro  
Production Engineer  
Reilly Windows & Doors

Images courtesy of Reilly Windows & Doors.

Autodesk, Autodesk Inventor, Inventor, and Revit are registered trademarks or trademarks of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product offerings and specifications at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document. © 2009 Autodesk, Inc. All rights reserved.