

Testing & Analysis of New FoldUp™ Window Design

“The model that RIT built gives us the confidence to know that what we’re building is 100% safe. COE-SM people were a pleasure to work with and pragmatic in their approach. We now are more confident to transition the product to mass production.”

Rochester Colonial
MANUFACTURING

FoldUp™

- Tim Forster
Division Director
Rochester Colonial

Our Partner

Rochester Colonial Manufacturing Corporation specializes in manufacturing, distribution and installation of windows, doors, and accessories for home and business. They have been successful in creating a new category of window, the FoldUp™ window, with a unique folding window design for both commercial and residential applications.



Opportunity Area

The new, patent-pending design for a FoldUp™ window is a custom window that resembles a traditional double-hung window when closed, but opens along a horizontal hinge at the meeting rails in the middle and folds inward and upward toward the ceiling. When open, the window exposes almost the entire frame opening for maximum ventilation, and also allows for easy cleaning. The FoldUp™ Window recently won the Architizer A+ Award in the Building Products/Window category, and has been added to Rochester Colonial’s high-end custom architectural line of Heartwood Fine Windows and Doors.

Objectives

Rochester Colonial contacted COE-SM to develop a design/analysis tool to guide window design for optimal performance and also to provide design and manufacturing guidance to achieve a more robust design to reduce manufacturing floor customization and to support mass production of models in many sizes.

Work Performed

RIT engineers reviewed the window design and mechanics, focusing on the performance impacts of variations in window geometry. A 2D kinematic model was developed for use by Rochester Colonial engineers and designers allowing for rapid analysis and optimization of design options with respect to window performance. Critical hardware was also analyzed for stress and deflection and modified designs recommended and analyzed.

Results

COE-SM developed the FoldUp™ Window Design Analysis Tool that enables Rochester Colonial to predict the impact of design changes on window forces, motions, and clearances. The new tool led to several changes in the base design and allows Rochester Colonial to design right the first time, reducing re-engineering effort on the manufacturing floor. Rochester Colonial can now confidently respond to customer requests and reduce overall job turnaround time in current low volume markets. The added design knowledge also provides confidence to pursue higher volume markets in the future.