

Virnig Manufacturing Case Study

Virnig Manufacturing uses PTC Creo Simulation Software to reduce design time by 25%

Business Initiatives

When it comes to skid steer attachments, it doesn't get better than Virnig. Located in the heart of Central Minnesota, Virnig Manufacturing has been designing and producing skid steer loader attachments for over 27 years.

However massive they may seem now, Virnig wasn't always the manufacturer we know today. When Dean and Lois Virnig got their start in 1989, the business operated out of a two-stall garage repairing farm and construction equipment. After five short years, the company discovered their niche - creating skid loader attachments.

Today, all steps of the manufacturing process are completed in-house. From engineering and cutting raw materials, to machining, welding, and painting the finished product, every attachment is designed and produced at Virnig's facility.

Virnig now carries over 40,000 attachment parts and offers more than 80 unique skid loader attachments. Headquartered in Rice, MN, Virnig's 67 employees have over 400 years of combined industry experience. The family owned and operated business has grown into a premium skid steer attachment manufacturer supplying North America and beyond.



Business Challenges

Virnig has been challenged more than ever to produce high quality, lightweight attachments in order to outperform competition.

Darin Virnig, Manager of Production and Engineering explained, "We try as a company to get repeat business and to demonstrate to our customers that we have a solution for their problems. As our products continued to get more complex, they became heavy and overbuilt compared to our competitors. We knew we needed to lighten the machinery parts to reduce cost. As a company we had to look to practices that gave us confidence in our processes before jumping into prototyping. "



Slimline Ladzder Step & CAD Drawing
Engineered by EAC's Extensioneering™ Group

Darin knew his team needed to maintain a high level of quality and also saw an opportunity to increase operational efficiency and customer satisfaction. To deliver on this goal, Virnig needed to provide employees across the organization with an in-depth view of how designs performed in real-world conditions. This understanding would help Virnig reduce or eliminate product related issues in the field, lighten machinery parts, and reduce costly prototyping. By virtually testing real-world conditions, Virnig could maintain high quality standards while optimizing and adjusting to their product lines.

Prior to implementing simulation software, Virnig tested product designs using trial and error or the build-and-break method. As products became more complex, the team realized the importance of accurate structural analysis. Virnig's engineers found PTC's integrated simulation tool easy to design, analyze and optimize the attachment lines.

Creo Simulate allowed Virnig to save 10% on labor and assembly time

Virnig used Creo Simulate to innovate their most popular product, the Pickup Broom. Traditionally the product consisted of a top with hydraulically driven bristles engineered to propel dirt into the bucket located on the bottom.

With the Pickup Broom in particular, Virnig faced challenges as they attempted to lighten the machinery parts. To effectively analyze the deflection and strength of the product components, Virnig needed to test several design variations. Using Creo Simulate, the team was able to virtually test multiple product designs in real-world conditions.

At the touch of a finger, Virnig identified over built areas on the Pick-up Broom. Their findings directly translated into lowered manufacturing costs, and lighter weight products that adhered to quality and manufacturing standards.



Pictured above, the Pick-up Broom
The broom efficiently sweeps dirt into the attached bucket, which is then easily emptied for effortless cleanup.

Solutions

PTC Creo Simulate

Eager to reduce costs, decrease weight, and eliminate reliance on physical prototypes, Darin and his team turned to a PTC product called Creo Simulate. Because the engineers had used PTC Creo (formerly known as Pro/ENGINEER) as their primary CAD tool for several years, they felt it was only logical to turn to PTC's Creo Simulate. Creo Simulate is designed to provide users with accurate design simulation capabilities right within their CAD platform. By using the software's simulation tools to create virtual prototypes, users are able to visualize and test a product's structural performance before cutting any steel. This saves Virnig time, energy, and money as they are designing new products.



Pictured above, skid steer attachment tools that Virnig Manufactures in their facility every day.



With the help of Creo Simulate, Virnig was able to reduce the Pickup Broom cost by 5% without compromising quality. Creo Simulate also allowed Virnig to save 10% on labor and assembly time throughout the product development process by eliminating most of the expensive and time consuming prototype manufacturing.

Darin explained, “We were able to resolve the problems we had with field issues as we got more comfortable with the software. We saw it replicate places that had problems showing us the high stress areas and factors.”

“ Simulate on average has provided us a time savings of at least 25%, because we don’t have to do as much trial and error on testing and prototyping ”

-Darin Virnig, Virnig Manufacturing

The benefits didn’t just stop there. Simulation allowed Virnig to use analysis early and often to verify and optimize the attachment product’s design integrity, function, performance, and cost. On average the company saved 25% on design time.

Today, Virnig saves an average of 5 hours on every product they produce.

Darin stated, “We were able to finish the product faster, especially the structural parts that we manufacture by cutting and molding. Simulate on average has provided us a time savings of at least 25%, because we don’t have to do as much trial and error on testing and prototyping.” Today, Virnig saves an average of 5 hours on every product they produce.



Skid steer attachments being painted and finalized for customers.

Virnig continues to be a leader in the skid steer attachment industry.

“ We have saved material, labor, and product while being confident that our quality hasn’t been compromised ”

-Darin Virnig, Virnig Manufacturing

Darin explains what he considers the real value of Creo Simulate, “We have saved material, labor, and product while being confident that our quality hasn’t been compromised. Creo Simulate is saving us money and putting us at a competitive advantage- there is no doubt about that.”

By integrating the latest product development technologies and using top-of-the-line materials, Virnig continues to be a leader in the skid steer attachment industry.

Special thanks to Darin Virnig and Virnig Manufacturing for their input and cooperation while developing this report.

