SIEMENS | SARATECH

CONSUMER PRODUCTS AND RETAIL

Samsonite

Luggage manufacturer uses Simcenter 3D to design lighter and impact-resistant suitcases

Product

Simcenter

Business challenges

Design light and impact-resistant luggage

Reduce trial and error

Evaluate as many design alternatives as possible within a short period of time

Gain performance insights faster

Keys to success

Deploy an effective design-to-simulation process using Simcenter 3D

Develop in-house expertise to accurately model suitcase components

Siemens Digital Industries Software helps Samsonite dramatically reduce product lead time through virtual prototyping

Quality in a classy design

Anyone who travels knows the hassle: arriving at the airport, in a rush and heavily packed, but a bit relieved that your suitcase features a steady pair of wheels that can assist you. You put your luggage on the scale. It's your lucky day. Even though you've been packing far more clothing and gear than you will ever be able to use during the course of your trip, you managed to stay within the airline's allowance. The front desk officer tags your suitcase, and then it disappears into a black hole where it bumps along a network of conveyor belts and travels through hands that may not be as careful with it as you are before it gets on the plane. And once you arrive at your destination, you're praying to see your suitcase back in the same state as you left it, and with everything inside intact.

Many people choose to buy a suitcase for its fashionable design. But at the same time, the functional performance requirements are not minor, especially in terms of weight and durability. And the market shows very little tolerance for failure. A bad experience makes consumers instantly opt for another brand, and with online reviews and social media, customers have the power to kill a company's reputation. Among the many manufacturers who bring suitcases to market, only the ones who can deliver consistent quality survive.

Over more than 100 years, Samsonite has built a solid reputation in the travel goods



Keys to success *(continued)*

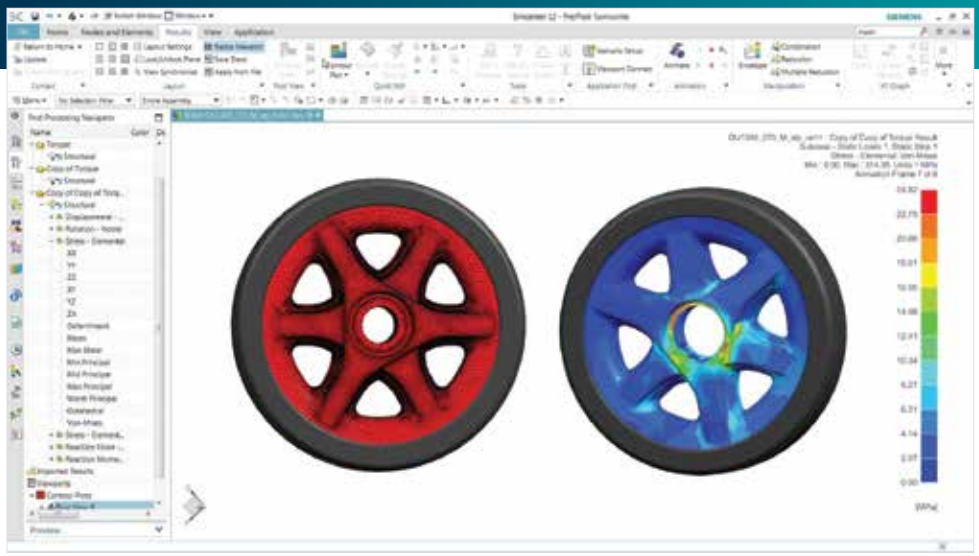
Quickly evaluate multiple design alternatives in a streamlined process

Results

Dramatically reduced the number of physical proto-typing cycles

Created lighter and stronger luggage in shorter time

Enabled funding for future research



"Since we started using Simcenter 3D, we have an effective process in place to do our job, which is making light and impact-resistant luggage."

Vivien Cheng
Head of the Product Development Department
Samsonite

sector. Running a successful business for such a long time with a rather small variety of products is truly exceptional. Samsonite's secret? Besides creating classy designs, they continually seek out new material technologies and production methods, and have an absolute obsession for quality. Very few products are more thoroughly tested than the suitcases that withstand the torture rooms in Samsonite's factories.

Starting with FEM

In Oudenaarde, Belgium, Samsonite engineers apply the latest material and production techniques to develop the lightest and strongest suitcases. All the models for the European market are made here, and some designs are produced and offered in global markets. To become more effective in achieving the desired product quality, the Samsonite team in Oudenaarde selected Simcenter™ software from Siemens Digital Industries Software.

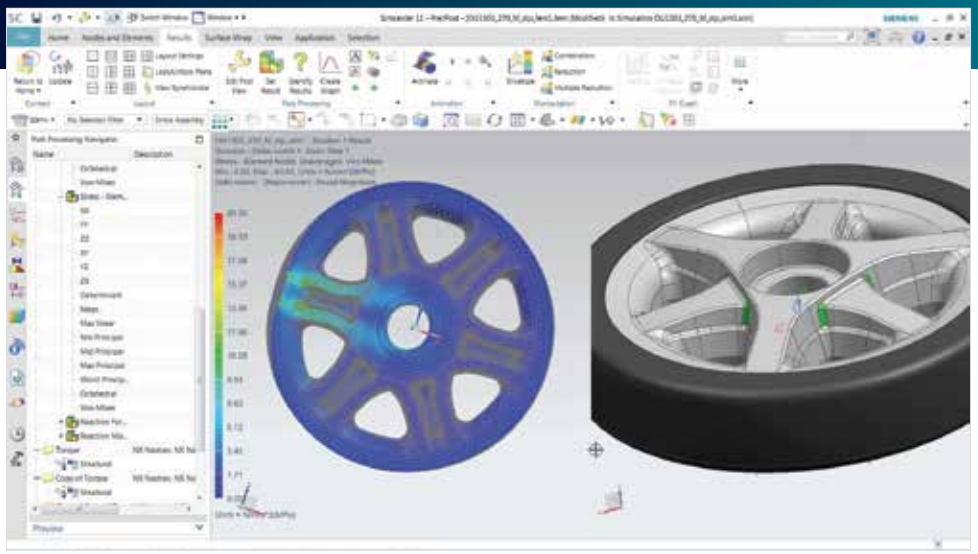
"We were already Siemens customers for a very long time," says Vivien Cheng, head of the product development department. "For many years we have successfully used NX software for our CAD/CAM work. So when we realized we could benefit from increasing our knowledge in CAE and FEM, and from deploying a solution inside our organization, Simcenter 3D was the logical choice."

Samsonite recognized the relevance of using the finite element method (FEM) more than 10 years ago. The company outsourced the analysis for a while, before building up the know-how internally and doing it in-house. Now that the company has made the necessary investments, Samsonite has three enthusiastic engi-neers who perform the bulk of the simulations and are eager to extend the range of the application for the insights it provides them.

> "Simcenter 3D helps us dramatically reduce product cost and lead time, while increasing quality."
>
> Vivien Cheng
> Head of the Product Development Department
> Samsonite

Gaining insight

"Most of our CAE work is currently still on an as-needed basis," explains Gilles Vanneste, 3D engineer at Samsonite. "From the tumble and the drop tests, we observe damage on, for example, the wheels, a bracket, the carry handle, or the shell, which is unacceptable. Using that knowledge, and by applying the proper



boundary conditions, we then try to simulate the behavior in Simcenter. In this way we can discover the locations of high stress concentration, which areas need to be improved, where we need to reinforce, and much more. Sometimes we even learn things we had no idea about, such as the effect of adding ribs on the overall suitcase stiffness."

These valuable insights gave Vanneste the taste for more. He is quickly building up knowledge of boundary conditions and improving his modeling skills. That doesn't stay unnoticed within his team. "It regularly happens that a designer comes to me with only the drawing," says Vanneste. "We then evaluate whether the suitcase will be strong enough, or if the entire concept needs to be reconsidered. It's actually quite thrilling when thinking about it in this way, because it means that we are doing all the prototyping in a virtual way. The main advantage of using Simcenter 3D is that we quickly get feedback on whether certain components are strong enough, or whether we can make the structure lighter. It helps us to decide where we can remove material, and guides us to where we need to add it."

Reducing physical prototyping

Wim De Vos, project manager at Samsonite, confirms that the amount of physical prototyping has been dramatically reduced since the company implemented Simcenter 3D. The main benefit is significant time savings. "In the past we went straight from the design table to creating a physical prototype, which we then tested," says De Vos. "That process took us about 16 weeks, and we weren't even sure if the suitcase would be as strong as expected. "Simcenter 3D allows us to do upfront simulations, reassuring us that the prototype will be okay from the first time, avoiding several loops."

"Simcenter 3D helps us dramatically reduce product cost and lead time, while increasing quality," says Cheng. "It's hard to quantify this, as we are annually busy with more than 10 projects on different scales, from makeovers of existing products to creating completely new ones. But since we started using Simcenter 3D, we

"Sometimes we even learn things we had no idea about, such as the effect of adding ribs on the overall suitcase stiffness."

Gilles Vanneste
3D Engineer
Samsonite

"Simcenter 3D allows us to do upfront simulations, reassuring us that the prototype will be okay from the first time, avoiding several loops."

Wim De Vos
Project Manager
Samsonite





Solutions/Services

Simcenter 3D
siemens.com/simcenter3d

Customer's primary business

Samsonite is the leading global supplier of luggage, from mass market to luxury products sold under the Samsonite, American Tourister and other brand names.
www.samsonite.com

Customer location

Oudenaarde
Belgium

have an effective process in place to do our job, which is making light and impact-resistant luggage."

Even more FEM in future

Cheng sees the application of Simcenter 3D growing in the future. "We have to increase our simulation capabilities," she says. "More accurate modeling and boundary conditions along with the execution of dynamic simulations will help us create even better suitcases."

Cheng also highlights another important aspect that makes Samsonite walk further down the simulation path. "Simulation will be crucial to innovate our products," she says. "We collaborate with universities to do research on composites. Doing finite element analysis using Simcenter 3D is required to prove that we are serious about it, and to get funding. Thanks to using FEM, we could produce our self-reinforced polypropylene luggage, which is the lightest on the market. This has been an enormous success. We are very determined to continue working on this, and further optimize our materials to keep our number one position."



> "The main advantage of using Simcenter 3D is that we quickly get feedback on whether certain components are strong enough, or whether we can make the structure lighter. It helps us to decide where we can remove material, and guides us to where we need to add it."

Gilles Vanneste
3D Engineer
Samsonite

For more information on **Simcenter**, please contact us at: 949.481.3267 | info@saratech.com

SARATECH

saratech.com

Siemens Digital Industries Software

Americas 1 800 498 5351
Europe 00 800 70002222
Asia-Pacific 001 800 03061910

For additional numbers, click here.

siemens.com/software

© 2018 Siemens. A list of relevant Siemens trademarks can be found here. Other trademarks belong to their respective owners.

70478-D10 7/18 C