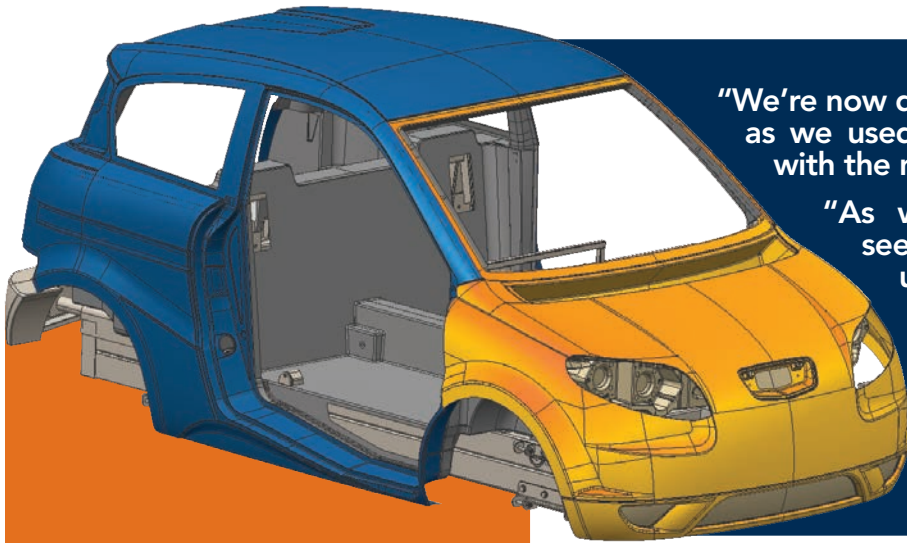# Composites Innovation Centre Speeds up Design and Prototyping using NX

> "We're now doing design analysis at least twice as fast as we used to. The most noticeable improvement with the new software was in design optimization."

> "As we work with our customers, they're seeing what we can do in design analysis using NX. The more we show them what we can do with the software, the more comfortable they feel with it, and the more they are willing to mandate us with more substantial projects."

> *Alastair Komus, Principal Engineer, Ground Transportation Sector, CIC*

Company:
The Composites Innovation Centre Manitoba Inc.

Products:
NX and NX Laminate Composites

Challenge:
Using multiple software packages was slowing down the design team, precluding large design analysis projects

Results:
· Doubled performance on design analysis for the entire team

· Integrated design, model, and analysis in one software

· Analyzing up to 40 different combinations

· Now more competitive in providing analysis, prototyping and testing services to customers

Composites Innovation Centre Develops Cutting-Edge Designs Using NX

Rising fuel costs and environmental concerns are generating interest in composite materials these days. And the Composites Innovation Centre (CIC) - among Canada's largest composites research facilities - is there to help. The CIC is a leading-edge research center focused on composites design analysis, process development, and manufacturing support, and have had a hand in everything from the Boeing 787 Dreamliner to various transportation and medical industry initiatives.

NX CAD/CAE Integration Beats Other Tools

The CIC used to rely on separate packages for design and for analysis. While each software package could handle their individual tasks, optimizing designs was proving slow and manually intensive.

"When it came to composites, our previous analysis package was not user-friendly or efficient," says Steve Crouch, Principal Engineer for the Aerospace Sector at the CIC. "If we wanted to make changes to the geometry, we had to make changes in the modeling software, then go back to the analysis software, redo everything, and look at the results."

"It required a great deal of manual work," adds Alastair Komus, Principal Engineer for the Ground Transportation Sector at CIC. "There was a lot of set-up work to do, and it was very time-consuming."

Since design analysis was so labor-intensive, the team couldn't take on complex or large design analysis projects, and frequently outsourced or turned them away.

NX and NX Laminate Composites: The Ideal Solution
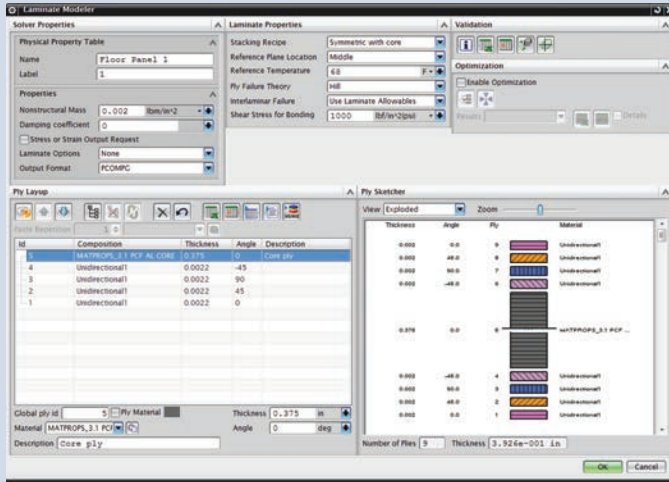
To improve their composites design analysis capabilities, the CIC team launched a large market survey to evaluate every appropriate software available.

"We looked at pretty much everything that was available for modeling and analysis," says Steve. "We talked to our customers, assessed what was on the market, and ranked them against each other. We got it down to a shortlist of five before deciding on NX and MAYA-authored NX Laminate Composites."

The team liked the software application features in NX, as well as the licensing model that came with it.

"Integrated design, modeling, and analysis were critical elements. We were also impressed by the composites capabilities in NX," says Steve. "Finally, NX made the most sense from a cost perspective."

The common UI shared between NX Design and Simulation, along with the tight integration, shortened the learning curve for CIC engineers and significantly reduced the implementation time. Within two weeks the CIC was using the software effectively and improving their efficiency.

Doubling Production Capability While Optimizing for Weight
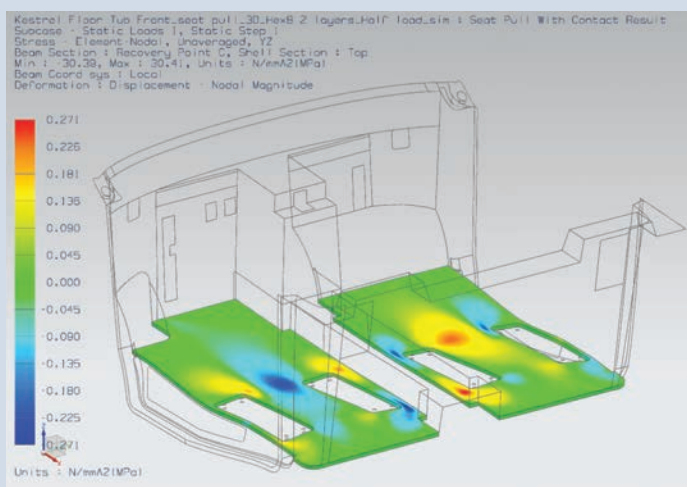
"We are constantly optimizing designs for weight," says Alastair. "With NX, we can assess initial results, go back and make adjustments, then compare results to see if it's lighter and/or cheaper to build. We run that repeatedly until we get something that we think will be the lightest possible."

"We couldn't do that before. We're optimizing designs much more efficiently now," says Steve.

Complete Virtual Prototyping for Composite Design

NX and NX Laminate Composites allow engineers to easily create, manage and optimize their laminates, including the definition of ply materials.

"We'll run 20 or so different combinations on some of our models," says Steve. "For the Kestrel, we looked at 40 different ones. We would never even have tried that with our previous software."
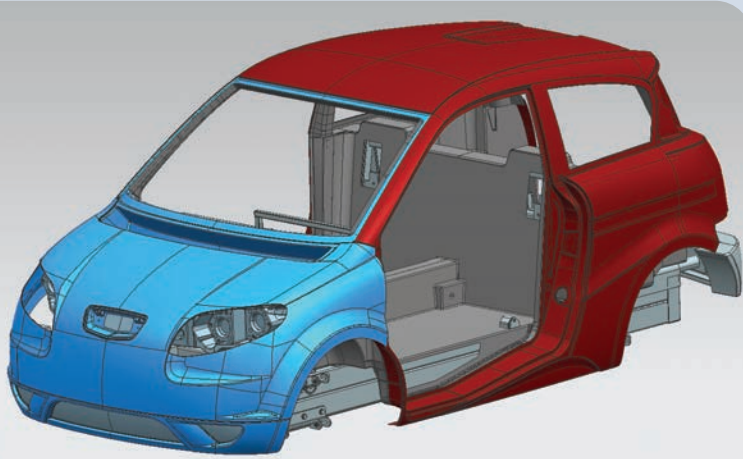

The "Kestrel" is an exciting new electric hybrid vehicle commissioned by Motive, a multiple award-winning design firm. Kestrel features hemp-based composite materials for a lighter, less expensive and more environmentally sustainable vehicle. The CIC is playing a central role in its development.

"The most significant development is that we are now working on structural parts," says Alastair. "Our automotive design analysis used to be for non- or semi-structural parts. We're now conducting design analysis for the full vehicle structure, and we're including as much flax and hemp materials as possible, which is where we can make real gains in weight reduction."

MAYA expertise ensured success

The research teams at CIC are excited to provide a more complete service to their customers, and maximize the full power of their knowledge base. And MAYA is ensuring they've got the right tools to do it.

MAYA is proud to be providing the tools and support that are assisting in the latest technological developments in transportation. "MAYA is a great company to work with," Alastair says. "They've helped us fill a critical gap in the value chain."
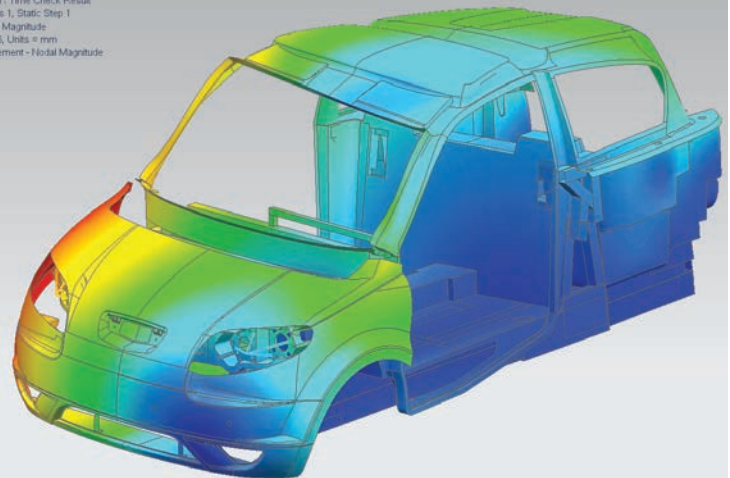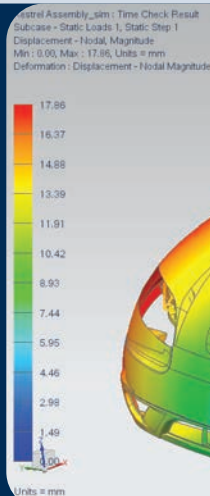
"Each new release has added more important functionality. We've seen a lot of improvements in laminates analysis capability that have made it easier for us to do our job."

Steve Crouch, Principal Engineer, Aerospace Sector, CIC

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