

## Honda Motor Company

MSC Apex allows for multibody dynamics engineers & structural analysts to share common user experience during their development process, resulting in cutting the workflow times by 50%.

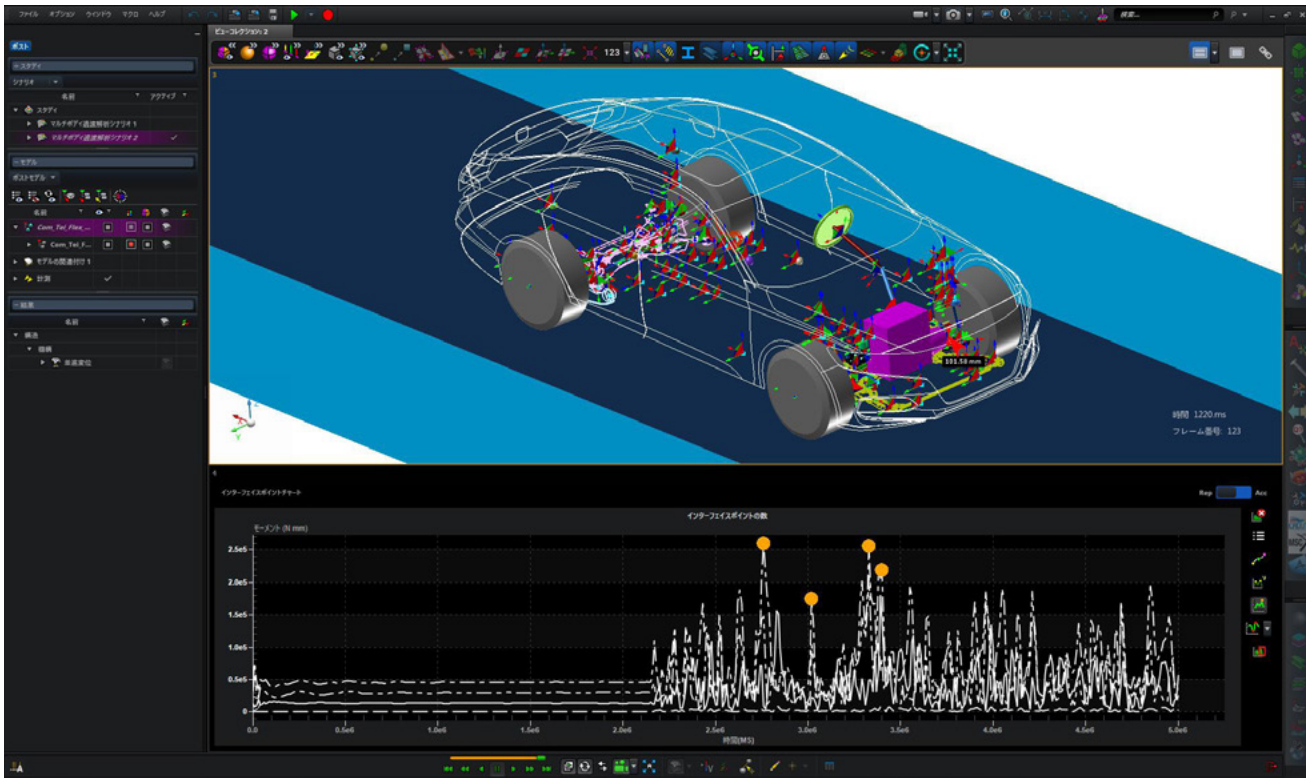


**“Since we were able to use existing Adams and MSC Nastran models together, along with the ability to automate with Python scripting, the time required for model creation, analysis preparation and post processing has greatly shortened. Designers, testers, and analysts can now all use one common platform with MSC Apex.”**

**Shigeki Nomura**  
Assistant Chief Engineer, Honda Motor Company

Today, drivers of modern automobiles take it for granted that their new car prevents them from spilling their drink as they drive over a speed bump. It's also pretty much guaranteed that your steering wheel won't shake at high speeds when you're on the highway. And probably most important of all, in case of an accident or crash, there's a good probability that you and your family have a high chance of surviving.

These things were not always guaranteed. We have our global automotive engineering community to thank for making these things common amongst the cars we drive today, and at the heart of these engineering designs is an immense amount of mechanical and structural simulation using MSC Nastran and Adams Car -- two products that have been at the heart of automotive engineering innovation for decades.



Above: Adams/Car post-processing on the Honda Accord Multi-Body Dynamics simulation in MSC Apex.

## Challenge

At Honda Motor Company, headquartered in Minato City, Tokyo, Japan, the automotive engineering worlds of “structures” and “mechanics” are incredibly important to the design of a new car. But up until recently, these have been separate groups that historically had very little overlap. Both are heavily involved during the design process, but since each group had different teams of engineers, used different software tools, built different models, and ultimately searched for different answers from those software models, there wasn’t an easy way to combine these engineering insights together to get a clear high-level picture of how a new car design would behave in the real world.

Until recently, multibody dynamics engineers using Adams simulation software were separate from the structural engineers using MSC Nastran finite element software. The engineering leadership team at Honda needed a solution.

## Solution

Engineers at Honda evaluated MSC Apex as a potential solution to this efficiency issue. There were 3 main driving factors that attracted engineers at Honda to MSC Apex -- pre/post processing for the MSC Nastran solver, pre/post processing for Adams Car (which has the same user experience as MSC Nastran pre/post), and finally the robust Python scripting capabilities allowing for them to

customize the application to their needs and automate specific tasks to speed up the entire process.

“The engineering team [at Hexagon] introduced me to the MSC Apex and the future plan, and I was very impressed,” said Shigeki Nomura, Assistant Chief Engineer at Honda Motor Company. “We knew this was the future of engineering simulation.”

After the initial evaluation, MSC Apex had the possibility to achieve the previously impossible task for Honda – combining mechanical analysis and structural analysis, from two solvers they’ve trusted for decades – Adams and MSC Nastran. Since MSC Apex is able to handle both simulation results in the same tool, it had the possibility of increasing the efficiency of their engineers by being able to speak a common software language.

### Key highlights:

Product: MSC Apex

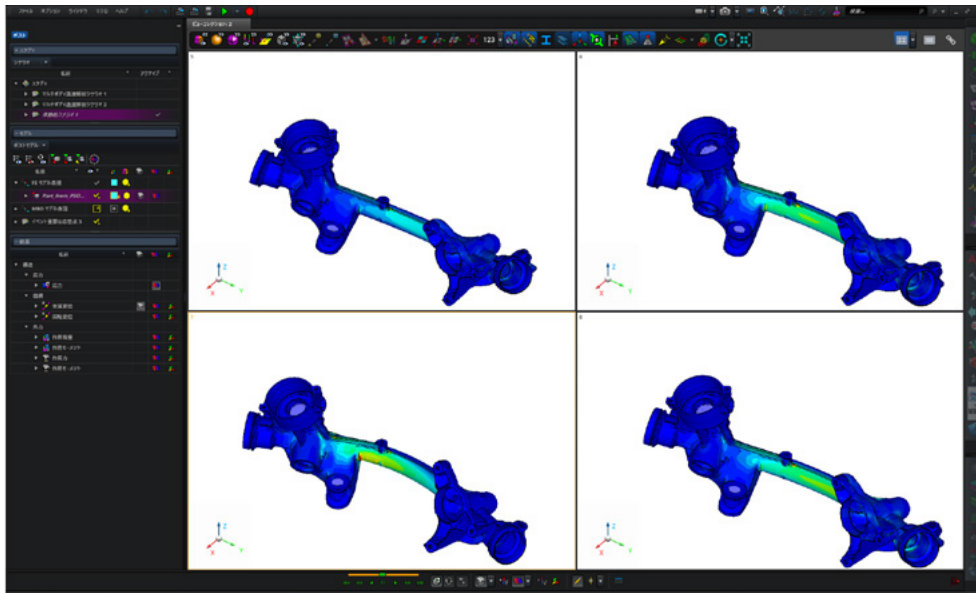
Industry: Automotive

Benefits:

Unified modeling environment for both MSC Nastran & Adams solvers

Combined multibody dynamics analysis and structural analysis resulted in quicker workflows

New modeling environment resulted in 50% of the original man-hours required to complete the design



Above: MSC Nastran post-processing on the Honda Accord Structural Analysis simulation in MSC Apex.

## Results

By using MSC Apex for existing models (Adams and MSC Nastran), combined with automation by Python scripting, the time required for model creation, analysis preparation and post processing was shortened by 50%.

In addition to time savings, Designers, Testers, and Analysts were all able to use a common model in MSC Apex, giving a wholistic view of the structural and mechanical behavior of the car.

Due to these inspiring initial evaluation results, engineers at Honda plan to use MSC Apex for mass production model development from now on for their future vehicle designs.

## About Honda Motor Company

Honda Motor Company, Ltd. (commonly known as Honda) is a Japanese mobility manufacturer.

While having engines as its core technology, Honda has automobiles and motorcycles as its key products. As a motorcycle manufacturer, it has been the largest in the world. In addition, Honda is developing its life creation business, such as agricultural machines and generators, and aircraft engine business.

In the future, the company will thoroughly work on the environment and safety concerns we all are facing today. Honda aims to lead the evolution in the areas of mobility, power units, energy, and robotics.

**“ The time required for model creation, analysis preparation and post processing was shortened by 50%. ”**

**Shigeki Nomura,**  
Assistant Chief Engineer, Honda Motor Company



Above: The Honda N-Box, the top-selling Honda in Japan in 2021.



Above: The Honda HRV, which undergoes many multibody dynamics simulations, due to its off-road capabilities.



Above: The Honda Accord, which undergoes structural analysis and road vibration damping to maximize driver comfort.



Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications.

Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Manufacturing Intelligence division provides solutions that use data from design and engineering, production and metrology to make manufacturing smarter. For more information, visit [hexagonmi.com](https://hexagonmi.com).

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