



DEMOCRATIZING WHEEL DESIGN

ALTAIR SOLUTIONS DEMOCRATIZE ACCURIDE'S CAE WHEEL ASSEMBLY PROCESS

About the Customer

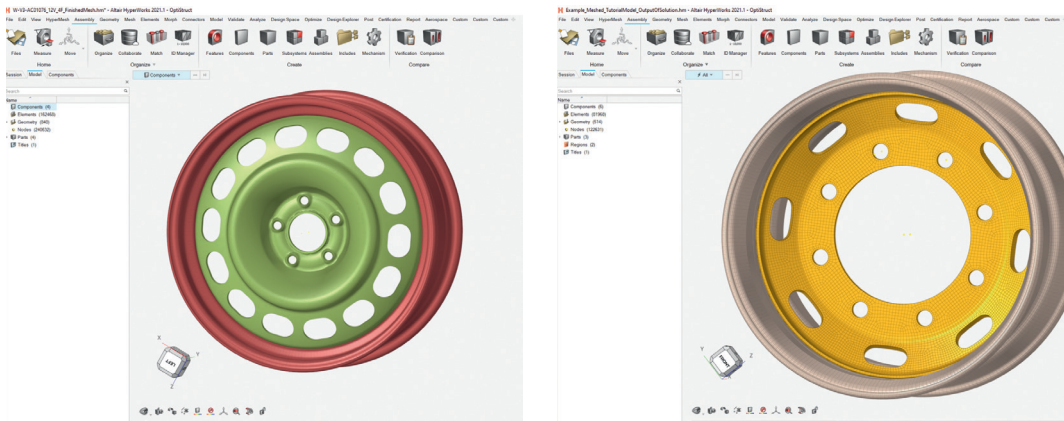
Accuride Corporation is a leading, global commercial and passenger vehicle component supplier and manufacturer. The company's products include steel and aluminum vehicle wheels and wheel-end components, and assemblies for the European automotive and global agricultural, construction, and industrial equipment markets. Headquartered in Livonia, Michigan (U.S.), the company has facilities throughout North America, Europe, and Asia. Accuride relies on over 125 years of experience and advanced engineering analysis methods to create efficient designs and deliver value to its customers.



Thanks to Altair's expertise and services, the HyperWorks-based custom solution - which we developed in collaboration with Altair - automates the Hexa-Mesh creation of our truck and passenger car wheels, thereby bringing our previously needed seven hours of manual process work down to just seven minutes, which could save us up to 765 hours per year.

Guillaume Javanaud, Product Engineering Simulations
Accuride Wheels Europe & Asia





LEFT: Using the custom solution developed within HyperWorks, Accuride engineers were able to mesh complex parts, like the model with over 160k elements shown here, in minutes. **RIGHT:** Several FE modeling parameters – including element size, quality, and meshing techniques – can be controlled within the HyperWorks workflow.

For years, Accuride has focused on implementing company-wide virtual product development methods to democratize the product development process.

Their Challenge

When developing truck and passenger wheels, creating a solid hexahedral mesh is one of the most difficult and tedious tasks an engineering team must accomplish. While the geometry preparation and modeling requires an in-depth knowledge of advanced meshing techniques and component quality standards, the meshing of a rounded volume is also time-consuming. Furthermore, only a few engineers at Accuride could solve this monumental task, which means that time-critical projects might be on hold until they can finish this vital step. Sharing this meshing knowledge beyond department boundaries to include everyone – including simulation beginners – has been difficult for Accuride.

Our Solution

To solve this challenge, Accuride worked with Altair to develop an automated solution that cuts down the time teams need to spend on preparing surfaces and elements, which lightens overall development efforts. Using the model build and assembly tools of Altair® HyperWorks®, an artificial intelligence (AI)-driven simulation solution, the team developed a process that **empowered engineers to manage multiple configurations, mesh variants, and part instances and become independent of the expertise of finite element (FE) specialists**. By providing excellent building blocks for an automated solution, HyperWorks automates the Hexa-Mesh creation of truck and passenger car wheels based on provided user inputs like element size, the density of the solid mesh, and more, in a customized graphical user interface (GUI). The automated HyperWorks solution enabled the Accuride team to run a complete analysis and deliver reliable results in a much shorter timeframe.

Results

Together with Accuride, Altair developed a customized HyperWorks solution that fully automates the Hexa-Mesh process of truck and passenger cars' wheel assemblies. **The new automated workflow reduced a process that used to take seven hours of manual work to a mere seven minutes, which is estimated to save Accuride up to 765 hours per year**. Thanks to the new process that covers the workflow from CAD geometry to a fully created Hexa-Mesh, teams can find everything they need to set up this simulation in a single platform. Democratizing simulation to also include non-subject matter experts and simulation beginners through a standardized, automated solution also ensures all teams and products meet Accuride's high product standards. Because of how easy HyperWorks was to set up, and because of the outstanding results it delivered, Accuride plans to use HyperWorks throughout the company – including in the Accuride Partner Supply Chain – to further accelerate decision-making and streamline product development and innovation.

To learn more, please visit [altair.com](https://www.altair.com)