



# OPTIMIZING PROCESS DESIGN AT RENAULT

## FASTER AND EASIER RIM OPTIMIZATION USING ALTAIR® INSPIRE™ AND HPC

### About the Customer

Renault's Chassis Le Mans factory in north-western France is the oldest factory site of the major French automotive group, dating back to the 1920s. Founded in 2004, the chassis manufacturing department is also a "Centre technique Chassis" with dedicated centers for CAD development, prototyping, and testing. In total, the Chassis team consists of around 80 people. Part of this team works with Altair Inspire™ and Altair SimSolid™ including engineers on the calculation team and designers.

### Their Challenge

In today's highly competitive market, the automotive industry faces many challenges, including constantly decreasing weight standards. Recently, Renault reduced the mass of the devices across its entire product portfolio to achieve lighter cars. The best example is the aluminum wheel, on which an optimization methodology (based on Altair OptiStruct™) has been used for several years. The company needed to accelerate the process, as the traditional optimization process still required many iterations, simulation engineer involvement, and a considerable amount of time. With the strong simulation and optimization background of Renault Chassis Le Mans, Renault also turned to the CAD engineering centre to optimize the automotive rim of this current model. Usually, the optimization process starts with a designer requesting the specifications for a material reduction. As a result, the engineers invest time in calculations only to send these results back to the designers, leading to many iterations between the two teams. Renault wanted a solution to speed up the process and reduce lead time by obtaining a fast and efficient simulation process. The tight time schedule of the inquiry was an additional big challenge to this project, while keeping the target to reduce mass on this perimeter.

80% ▲

PROCESS  
AUTOMATION

TIME GAIN:  
FROM WEEKS TO

1 DAY

MASS REDUCTION UP TO

20% ▼

## Our Solution

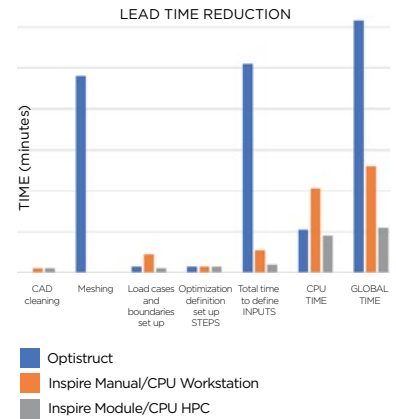
Since Altair and Renault have been collaborating for a long time, Renault didn't hesitate and turned to Altair to tackle its challenge. The idea at the Centre technique Chassis was to find a new, easy-to-use simulation tool that would allow non-experts, part-time analysts, and designers to gain insight and accurate results in early design phases of Renault chassis projects. The goal was to enable designers to run simulation by themselves without being dependent on the engineer's calculations. Based on Altair's experience, Renault's simulation specialists were able to realize a new solution using Altair Inspire. The additional implementation on the Altair HPC platform now enables engineers to send their highly complex calculations to the HPC server while running calculations on their workstation and simultaneously engaging in other activities. Furthermore, Altair offered support for this customization and implemented data input automation allowing engineers to add data easily, quickly, and with fewer errors. In the new process, the final design decision is made based on three criteria: mass, CFD, and design. If the proposed rim design is not feasible or is too expensive, a balance must be found among these criteria before the rim can go to production.

## Results

Thanks to Altair's solutions, Renault engineers are now able to transfer their calculations to the HPC server while still having enough computing power to run other processes on their workstations. Furthermore, automation enables more than 80% of automatic input data to be processed.

Another major improvement is the increase in productivity for the process operators.

While the traditional process required several days or weeks, it now takes just one day to find the optimal results using Inspire and the HPC platform. This shows that Renault Chassis Le Mans has not only reduced the mass of its rims, but has also significantly reduced its lead times thanks to the easy and quick use of Altair Inspire, data input automation, and HPC.



**TOP:** Using Altair Inspire, Renault was able to achieve a significant lead time reduction. **BOTTOM:** Accelerated process design of Renault rims thanks to optimization with Altair Inspire.