Grupo Antolin adopts Virtual Performance Solution for seat design and manufacturing testing

THE CHALLENGE

Grupo Antolin designs and produces car seats. To comply with OEM requirements, Grupo Antolin has to build lighter seats without compromising on performance. To do so, they have had to address two major constraints using simulation: the weight and the performance of the seats.

THE BENEFITS

- Reduce the seat development simulation time from half a day to one hour,
- Leverage best practices and optimize workflows thanks to task automation,
- Use dedicated tools for seat design accross all performance domains (safety, comfort...),
- Benefit from automated tools for processes including quick and transparent data transfer.

"Thanks to the new enhancements for task automations, accurate safety tools corresponding to our needs and easy-to-use data export and automation in the post-treatment, ***we saved about 50% time for each simulation loop."***

Franck Chantegret,
Simulation Manager,
Grupo Antolin Seats Business Unit

Grupo Antolin is an international Tier One company for the automotive industry. As a supplier of components for vehicle interiors, Grupo Antolin offers its clients an integral service embracing the design, development, manufacturing and distribution of doors, seats and overhead systems.

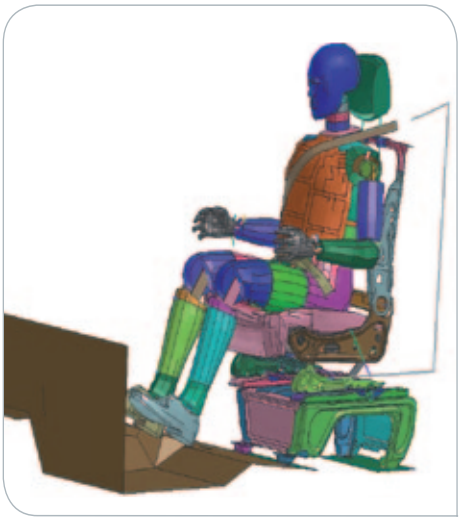
The French subsidiary of Grupo Antolin designs and manufactures seats for car manufacturers. Users of ESI's software PAM-CRASH since 1998 to simulate load cases on seats for frontal, rear and luggage impacts, they have upgraded to Virtual Performance Solution (VPS). With VPS, they can run both Explicit and Implicit simulations with a single core model. They also use Visual-Environment, ESI's dedicated user environment for pre- and post- analysis.

Reducing seat weight while ensuring its high performance thanks to simulation

Grupo Antolin's major objective, which is also part of the requirements from the OEM, is to lower the weight of seats thereby reducing the global weight of the vehicle and CO_2 emissions.

Decreasing weight requires the use of innovative materials, such as aluminum, which will have an impact on safety performances. Thus, it is especially important for the seat supplier to run crash test simulations, to make sure to pass the standards which are part of the OEMs requirements, such as the R14 and R17 safety standards. Simulation helps Grupo Antolin design and test virtually seat prototypes in order to find the best compromise to produce lighter seats, without compromising on quality.

Grupo Antolin uses Virtual Performance Solution in order to optimize the seat in terms of comfort, performance and weight, while taking into account the requirement to fulfill the seat safety standards (car crash and occupant safety).

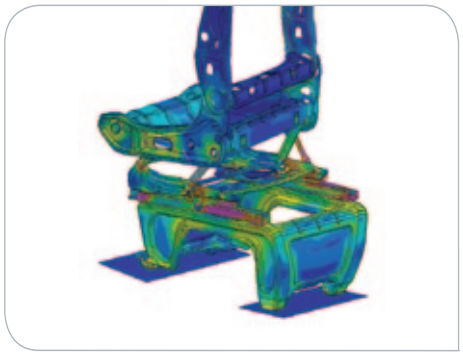


Sled test with a Hybrid III 50e percentile on a driver seat (AMS 50 km). Courtesy of Grupo Antolin.

Conceiving a commercial vehicle driver seat

Recently, Grupo Antolin designed and built for Renault all the seats (including driver, passenger and bench seats) for the Renault Master. The first step of that design process was to create and suggest to Renault a seat concept corresponding to their requirements and the seat type. Indeed, a commercial vehicle driver seat, a collapsible seat and a bench seat do not lead to the same concepts.

Renault Master's industrial driver seat.
Courtesy of Renault Group.



Seat driver stress contour.
Courtesy of Grupo Antolin.

The driver seat especially had specific constraints to be respected during the concept phase:

- The seat was placed on a metallic podium
- Some compartments were needed under the seat for accessories such as car jacks, repair kit, etc.

In addition to volume and space criteria, weight and passenger safety criteria, had to be respected.

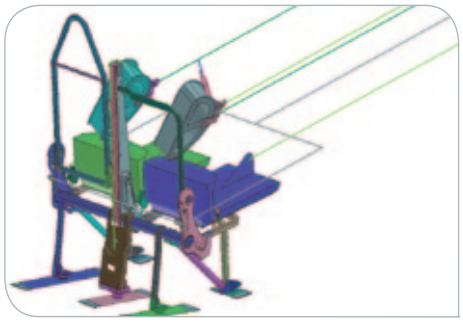
When the concept phase was approved by Renault, Grupo Antolin started the definition of the final design. A virtual prototype of the seat was built and optimized with the help of simulation to achieve the best compromise for size, weight and performance.

The metallic podium was adjusted particularly in order to reduce its weight.

The best way to reduce the metallic podium overall weight was to run a simulation using VPS reducing the metal layers and thicknesses, in order to find the best compromise between the material performance and its weight.

The calculation base was between 200 and 250 simulations with variants (several loading cases) in order to reach the final design result and the best compromise possible for the Renault Master driver seat.

Thanks to simulation, the seat weight was optimized and reduced in line with the requirements. **The total weight saving for the driver seat represented 20% of the previous model of the Renault Master driver seat.**



Static loading of safety belts (ECE R14).
Courtesy of Grupo Antolin.

Benefiting from a dedicated user environment

Grupo Antolin uses Visual-Environment, dedicated user environment included in VPS, for pre- and post-treatment of the seat models. Franck Chantegret, Simulation Manager at Grupo Antolin Seats Business Unit, highlights the advantages of tasks automation within Visual-Environment: *"With the former tools we used, the automation was not that developed.* ***Visual-Environment's interface is easy-to-use, saving us a lot of time, especially in post-treatment.*** *We have* ***all our design elements included in the same tool*** *and improved task automation."*

According to Mr. Chantegret, the safety tools in VPS are well adapted to Grupo Antolin's needs. Visual-Environment automatic tools reduce modeling and post-treatment errors. It ensures traceability and helps Grupo Antolin save valuable time in the design process.

With the belt generator, an automated tool available in Visual-Environment, instead of spending **a half day on adjusting a design, Grupo Antolin now spends less than 15 minutes.**

In the future, Grupo Antolin will continue using Virtual Performance Solution to optimize seat design and manufacturing with simulation.

To find out more about ESI's Virtual Performance Solution, please visit: www.esi-group.com/vps

ABOUT GRUPO ANTOLIN

Grupo Antolin, leading global supplier of components for vehicle interiors, offers its clients an Integral Service embracing the conception, design, development, manufacture and distribution of Overhead Systems, Doors and Seats. This Spanish multinational operates in 23 countries with 88 plants and 20 technical-commercial offices. With its team of qualified professionals and the most advanced technologies, the Group has the capacity to seamlessly integrate with the infrastructures of its clients, who it supports on projects all over the world, supplying them with the highest quality products and services "in situ". Financial solidity, innovation, quality and competitive costs are what create the differentiating value of a company like Grupo Antolin, which strives on a daily basis to continue warranting the trust of its clients, investors and suppliers.

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ABOUT ESI GROUP

ESI is a pioneer and world-leading provider in virtual prototyping for manufacturing industries that takes into account the physics of materials. ESI has developed an extensive suite of coherent, industry-oriented applications to realistically simulate a product's behavior during testing, to fine-tune manufacturing processes in accordance with desired product performance, and to evaluate the environment's impact on performance. ESI's solutions fit into a single collaborative and open environment for End-to-End Virtual Prototyping, thus eliminating the need for physical prototypes during product development. The company employs about 850 high-level specialists worldwide covering more than 30 countries. ESI Group is listed in compartment C of NYSE Euronext Paris. For further information, visit www.esi-group.com.

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