CUSTOMER STORY

DRIVING AEROSPACE COMPETITIVENESS

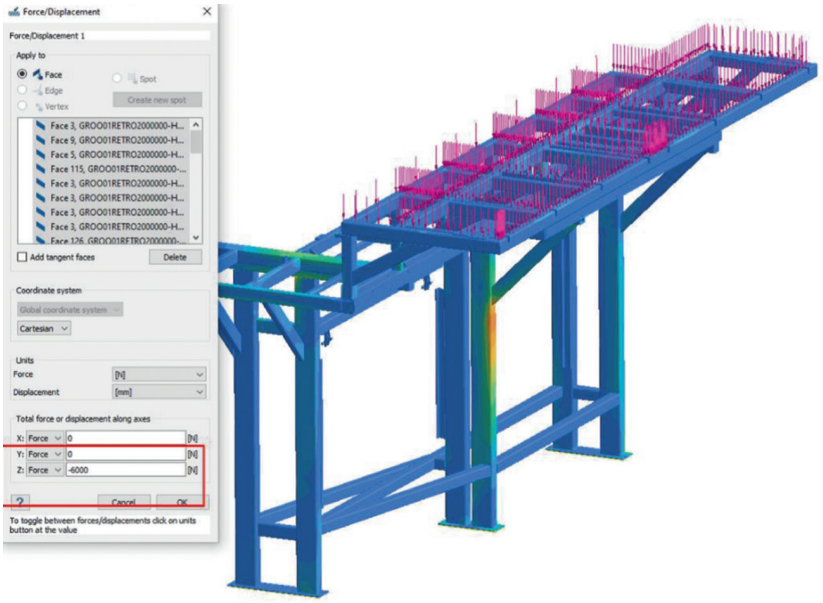
INESPASA ACCELERATES DESIGN OF AERO TOOLING STRUCTURES USING ALTAIR SIMSOLID®

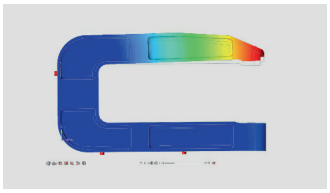
About the Customer

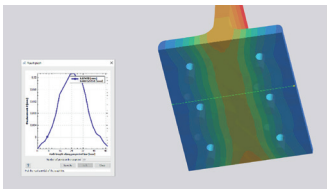
INESPASA, an engineering company based in Spain, offers comprehensive solutions for turnkey projects in the aerospace and automotive sectors. With more than 35 years of experience in research and development projects, tool design, manufacturing, precision machining, and sub-assemblies, INESPASA has been working with major companies such as Airbus, Alestis, Boeing, and Renault. The company's vision is to provide innovative, state-of-the-art solutions and advanced technologies to key players in aerospace and automotive and support them in the continuous evolution of their respective industries. Today, INESPASA has two production plants in PE Aeropolis (Sevilla) and employs a highly qualified workforce of 150 people.

> "The speed and accuracy of Altair SimSolid® and the efficiency of the Altair suite allowed us to develop the most complex aerostructure assemblies with confidence and faster than ever before, increasing the ROI.
>
> Cristóbal León,
> Head of R&D at INESPASA

Try Altair SimSolid® Today: **Download Now**







LEFT: Using Altair SimSolid within Altair's flexible license for structural simulation enabled the team to make fast decisions helping them to reduce the development time and improve their ROI. **TOP:** Applying Altair® Inspire™ for topology optimization INESPASA could predict and optimize the behavior of the principal component. **BOTTOM:** The stress and displacement results in Altair SimSolid are displayed as contour plots.

Their Challenge

To be successful in a highly competitive market, aeronautical tooling companies such as INESPASA must deliver maximum quality of complex products and components complying with highly demanding standards and regulations while meeting tight time constraints and limited budgets. Time has become a major challenge for many of INESPASA's projects focusing on the vertical integration of aerostructures, where adjustments are often required during the production of the first units, despite careful development. As developing and testing aircraft component prototypes is time consuming and expensive, INESPASA had to find new and faster ways – such as as multiphysics simulation – to evaluate its aero-structure designs, identify problems before they occur, and ensure the viability of the implemented solutions.

Our Solution

To achieve adequate stiffness values for the assembly instructions, the INESPASA team needed reliable results without resorting to the costly method of trial and error or time consuming, repetitive finite element calculations. To evaluate the component designs, the INESPASA engineers considered various simulation tools and decided to utilize Altair solutions, in particular the fast structural analysis tool Altair SimSolid®. With SimSolid, the engineers were able to simulate their aero-structure concepts quickly and virtually evaluate them. Later the team applied Altair® Inspire™ for topology optimization and Altair® MotionSolve® for multi-disciplinary simulations and system level analyses. The engineers performed multi-physical structural calculations to estimate the stiffness of the aeronautical structural elements to obtain a deformation level. SimSolid allowed them to evaluate different solutions rapidly and efficiently and with a high degree of accuracy to achieve the most suitable design. Thanks to the topology optimization in Inspire, the team was able to predict the behavior of the main component and achieve an optimal design. Initially without any detailed information, the engineers were able to evaluate the level of stresses and the critical paths of the stresses.

Results

Thanks to fast simulation results obtained with Altair solutions, INESPASA addressed the challenge and found the solution with the best weight-stiffness ratio providing an optimum usability of their aero structure elements. Additionally, the engineers also improved the overall service conditions. SimSolid's excellent computing capacities enabled the company to increase the agility of the decision-making process by avoiding late design modifications and hence significantly reduced the development time while accelerating innovation. As a result, the component can be manufactured using conventional chip removal techniques. Finally, the flexibility of Altair's unique licensing system allowed the team to diversify its resources and extend the usage of Altair solutions beyond SimSolid, significantly increasing the return on investment.