



BUILDING RELIABLE SPACE PRODUCTS 10X FASTER

ALTAIR SIMSOLID® STREAMLINES PRODUCT DEVELOPMENT CYCLES FOR ROCKET LAUNCH SYSTEMS

About the Customer

Based in Alameda, California, Astra is an aerospace company that offers one of the lowest cost-per-launch dedicated orbital launch services of any launch provider in the world – along with the Astra Spacecraft Engine™, the industry's first flight-proven electric propulsion system for satellites. Astra delivered its first commercial launch to low Earth orbit in 2021 - just five years after it was founded, making it the fastest company in history to reach this milestone.



Altair SimSolid is unique in that it's both fast and accurate, helping achieve meaningful design inputs in a fraction of the time it would take using typical, pre-existing tools.

Analysis and Flight Sciences,
Astra



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Their Challenge

When it comes to manufacturing innovative aerospace technologies, the product development and analysis process can be long and tedious. As part of their new generation launch vehicle and spacecraft engine product offerings, Astra was looking for a way to streamline their product development life cycle. They wanted a solution that allowed product and test engineers to learn more about the structural and thermal behavior of the hardware they were designing much earlier in the process. The goal was to ensure the integration of a tool that was both easy to use and didn't require much upskilling, model build time, or pre-processing work.

Our Solution

Astra produces rockets and spacecraft engines that are designed with reliability above all. While they intended to improve speed and efficiency, it was important that Astra's team not lose accuracy within their data and remain consistent with their pre-existing test results. As a solution, Altair SimSolid[®] can help reach maximum reliability in a shorter timeframe. Altair SimSolid is a structural analysis tool that eliminates geometry simplification and doesn't require a mesh to provide numerical dynamic, static, or thermal structural analyses. It can efficiently analyze complex parts and large assemblies without requiring extensive training or coding experience. And it's unique in that it's both fast and accurate, helping users achieve meaningful design inputs in a fraction of the time it would take using traditional CAD tools.

Ease of use was important to Astra. Users can transition from CAD to simulation quickly using straightforward workflows on full CAD assemblies. The user experience is seamless and eliminates traditional FEA roadblocks. Altair SimSolid dramatically accelerates the simulation process compared to traditional FEA solutions. With Altair SimSolid, Astra can make faster design decisions, leading to shorter time to market and a competitive edge.

Results

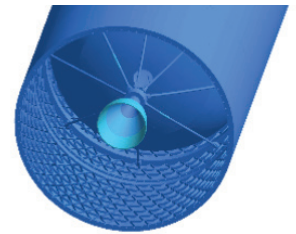
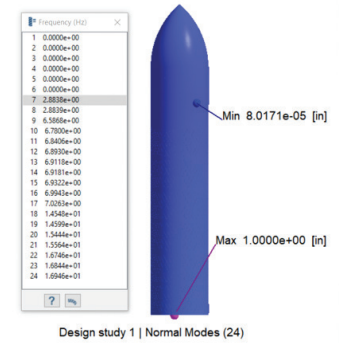
With Altair SimSolid, Astra was able to build and analyze better, more reliable products faster. It allowed Astra to perform the expected workload they needed, producing robust results and accurate reporting in a tenth of the time it took other in-house tools currently in use.

Ultimately, Altair SimSolid slashed Astra's analysis time. Using it early in the product development process narrowed analysis resources and freed more time for Astra to focus on other critical areas of the product life cycle. By performing simulation work faster, Astra could train their design team in a whole new way. Using Altair SimSolid meant they didn't need to be experts in structural analysis, and in turn, could approach the problem from a unique perspective using a meshless tool.

Altair SimSolid is an accessible solution for users of varying levels of expertise to perform early design studies, as well as for analysts seeking advanced structural studies. Altair SimSolid's performance demonstrated its power and assured the Astra team that it was capable of integrating their company's existing workflows. This, in turn, enabled accelerated product development and time to market for Astra's family of rocket launch vehicles.

Moving forward, Astra intends to expand its use of Altair SimSolid and continue collaborating with Altair to ensure that they're implementing new technology solutions that will drive simulation standards across the aerospace industry.

To learn more, please visit altair.com/simsolid



A representative rocket model in Altair SimSolid



Today, there is no tool in the market that can do what Altair SimSolid is capable of doing.

Analysis and Flight Sciences,
Astra