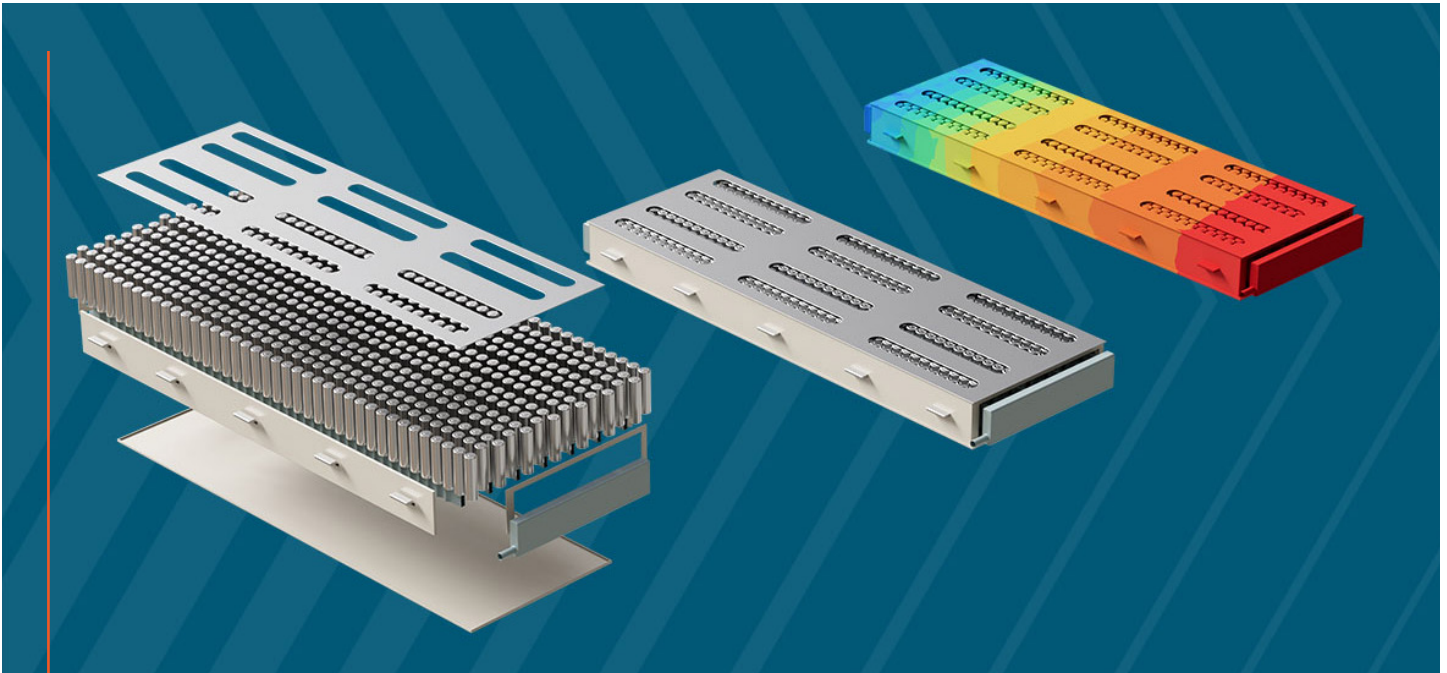




ALTAIR SIMSOLID®: 25 TO 100 TIMES FASTER THAN TRADITIONAL FEA

Multidisciplinary, structural, and thermal analysis with traditional FEA tools can take days or even weeks. Altair SimSolid provides highly accurate results in seconds to minutes. Plus, Altair SimSolid requires no special training, no CAD cleanup or simplification, no meshing, and no high-end GPU.

FEA Too Slow for Design

Simulation for multidisciplinary, structural, and thermal analysis has traditionally been used only for validation, not design. The reason is speed... or rather, a lack thereof.

Over the years, many vendors have sought to implement simulation earlier in the development process. Solutions like Ansys Discovery and the various CAD embedded structural simulation tools automate some elements of the simulation workflow, but most have severe drawbacks.

Almost all these tools are based on finite element analysis (FEA), a method that has long been used for structural analysis. Unfortunately, FEA methods are difficult to learn, and you need to understand the methodology to use the tools effectively. Gaining that knowledge requires extensive training and practice.

Even after you've acquired the expertise, setting up an FE model is a tedious, time-consuming process. The CAD geometry must be simplified before meshing. Mesh size and quality must be optimized to achieve an acceptable balance between accuracy and runtime. Even then, calculation runs can take hours.

Moreover, it's difficult to apply FEA solutions to complex systems. Due to the amount of time required for CAD preparation, meshing, and runtime calculations, it's inefficient to apply FEA to large assemblies, particularly in the early stages of design.

Nearly every structural analysis solution available today shares these drawbacks... with one exception.



The time we spent in CAD preparation, in meshing—there was no added value.

With Altair SimSolid, we've drastically reduced the time we spend on simulation.

[Hugues Masse,](#)
[modeling and simulation](#)
[research manager,](#)
[Plastic Omnium](#)



Try SimSolid Today:
[Download Now](#)

Altair SimSolid®: A Simpler, Uniquely Efficient Solution

That exception is Altair SimSolid®. Altair SimSolid doesn't use traditional FEA. Instead, it leverages a cutting-edge formulation based on deep mathematical research developed over many years. It provides industry-trusted accuracy while also being simpler and more efficient than the competition.

Altair SimSolid produces results much faster than traditional FEA, giving you design insights in seconds to minutes rather than hours or days. Add this efficiency to its greatly reduced model preparation time, and **Altair SimSolid provides results 25 to 100 times faster than traditional FEA solutions** over the simulation workflow without sacrificing accuracy. All this makes Altair SimSolid ideal for driving quality design, shortening design cycles, improving design performance, and lowering costs.

Altair SimSolid gives you simulation at the speed of design.

Numerous Advantages Over Traditional FEA Tools

Altair SimSolid offers several advantages over conventional FEA-based tools, like Ansys Discovery and CAD-embedded tools.

No CAD Cleanup or Simplification: Building a reliable FE model requires both time and expertise. Manufacturing-ready CAD geometry is normally too detailed for meshing. Certain simplification operations—like the removal of unnecessary features—must be performed manually to avoid meshing errors. These CAD editing operations often require a separate tool, like Ansys SpaceClaim. Worse yet, the resulting simplifications introduce approximation errors which propagate through the analysis.

With Altair SimSolid, model simplification isn't needed, eliminating any approximation errors simplification could've introduced.

No More Meshing About: FEA tools rely on meshing. But meshing presents several obstacles to achieving satisfactory results.

First, there's the trade-off between accuracy and runtime. Generally, the finer the mesh, the more accurate the results. Of course, the more elements one has, the longer the runtime. Deciding what element size and mesh quality to use requires expert know-how. Particularly for thin solids, tools like Ansys Discovery rely on an extremely high number of elements, making the analysis unaffordable.

Second, the FE model must be simplified to make it computationally practical. Engineers often use simple 2D forms to represent 3D objects. This process adds approximations that introduce errors.

Third, meshing is time-consuming. As we'll see in the next section, Altair SimSolid greatly reduces the time required for CAD prep and modeling by factors of 10x or more.

Thanks to its advanced mathematical formulation, no meshing is needed within Altair SimSolid – the manufacturing-ready CAD model is the simulation model. This cutting-edge formulation makes simulation with SimSolid much faster than Ansys Discovery and similar FEA tools, including CAD-embedded FEA.

Simulates Complex Assemblies Accurately: Building connections between parts is time-consuming and requires expertise. As a result, connections are often idealized, allowing for more approximations in the solution. Tools like Ansys Discovery lack the means to create welds or fasteners between parts, apply tightening, or introduce friction. Their results are therefore inaccurate, since the interactions between parts and the behavior around connections aren't captured correctly.

Altair SimSolid, on the other hand, takes advantage of all the data available in your CAD file and uses high-fidelity connections to ensure accurate representation and simulation of real-world behavior. It automatically locates, classifies (holes, fasteners, nuts, bolts, washers, springs, thin sheets, bearings, and welds), and creates connections as defined in the manufacturing-ready CAD model.



Thanks to Altair SimSolid, we can now simulate an entire complex machine in a fraction of the time, which we couldn't do before with any other simulation tool.

The speed of Altair SimSolid helps us gain insights into the behavior of complex structures under loads very quickly and early in the design process.

Hagen Möller,
design engineer,
ATNA

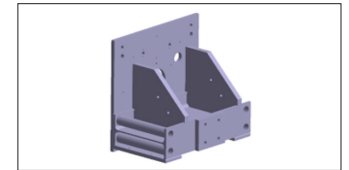


Figure 1: A 25-part assembly

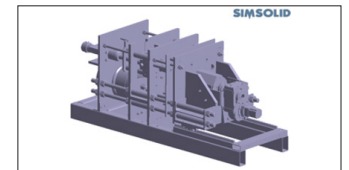


Figure 2: A 1,500-part assembly

Drive Early Design Decisions: Altair SimSolid lets you move simulation up front so you can drive design and shorten design cycles. It empowers designers and analysts to make validated, results-driven changes early in the design phase when change is far less expensive. They can explore many design variations quickly, without worrying about delaying product launch. You can maximize your first-pass design yield and achieve a robust design much quicker, making far fewer assumptions than with a traditional approach. This results in better design performance and quality at a lower cost, all while shortening time to market.

Flexibility to Run on a Standard PC, in the Cloud or on HPC: Ansys Discovery and similar products use your computer's GPU as well as its CPU in making their calculations. They require a high-end GPU that can cost thousands of dollars – a significant investment for every user running Discovery.

Altair SimSolid, on the other hand, runs all its calculations on your computer's CPU without the need for expensive GPUs.

As your organizational needs change and evolve, you can also leverage the cloud and high-performance computing (HPC). While most models can be simulated on a standard PC, Altair SimSolid offers you the flexibility to leverage HPC and gain optimal performance for very large models as well.

Simulation for All

Because Altair SimSolid is easy to learn and use, more people in your organization can take advantage of it. You don't have to be an analyst. You don't need to know anything about the mathematics behind the method; that's all transparent to the user. You don't even need a lot of training or experience to get the results you need.

In short, [Altair SimSolid](#) delivers world-class simulation to everyone on your team.



It was surprising how easy Altair SimSolid was to use. With very little guidance we had an engineer work through a very real problem quite quickly.

We saw a massive improvement in terms of the speed to generate results.

[Eric Gillund,](#)
[analysis manager,](#)
[Multimatic](#)