

Solid Edge Simulation

Powerful simulation functionality embedded inside Solid Edge

fact sheet

Siemens PLM Software

www.siemens.com/solidedge

► Summary

Solid Edge® Simulation software is a new, easy-to-use, built-in finite element analysis tool for design engineers to digitally validate part and assembly designs within the Solid Edge environment. Based on proven Femap® finite element modeling technology, Solid Edge Simulation significantly reduces the need for physical prototypes, thereby reducing material and testing costs, while saving design time.

Benefits

- Reduce the need for costly prototypes with virtual testing
- Get your product to market faster with reduced physical testing
- Innovate more by experimenting with your design virtually
- Reduce recalls by finding out if your product fails before it reaches the customer
- Optimize material usage and minimize product weight
- Execute redesigns faster with Synchronous Technology

Features

- Embedded finite element analysis for design engineers
- Part, sheet metal and assembly contact modeling with realistic component interaction
- Automatic finite element model creation with optional manual override
- Realistic operating environment modeling with full complement of loads and constraint definitions
- Maintains loads and constraints during model changes
- Synchronous Technology for fast model redesigns

For use by design engineers

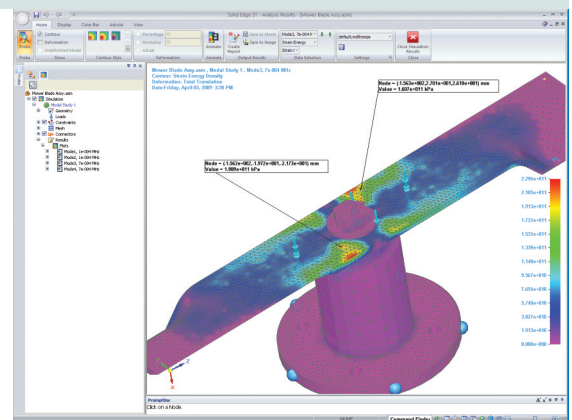
The optional, built-in Solid Edge application uses the same underlying geometry and user interface as all Solid Edge applications. Solid Edge Simulation is easy enough for any Solid Edge user with a fundamental understanding of FEA principles, yet robust enough to service most of your analysis needs. By allowing engineers to perform their own simulation, more analysis gets done in less time – improving quality, reducing material costs and minimizing the need for physical prototypes – and without incurring the high costs of outsourced analysis. The layout of the user interface is designed to guide the user through the whole analysis process, with on-hand help if required, which makes it easy to learn initially, and revisit as and when required for the occasional user.

Automatic finite element model creation

You can create and refine finite element meshes where required to improve accuracy of results. Solid Edge Simulation supports solid meshes (using tetrahedral elements) as well as two-dimension shell element meshes on mid-surfaced sheet metal structures. A mesh size slider bar that makes element size adjustments to the overall finite element mesh is available, and you can fine tune the mesh with manual edge and face element sizing to generate an efficient simulation model that will deliver accurate results. In addition, prior to creating the finite element model, you can use Synchronous Technology, with its ability to make history-free model changes, to prepare and simplify the geometry model quickly and easily.

Full complement of load and constraint definitions

Solid Edge Simulation provides all of the boundary condition definitions that you'll need to define realistic operating environments. The constraints are geometry based and include fixed, pinned, no rotation, symmetric and cylindrical variations. The loads are also geometry based and include mechanical as well as temperature loading for thermal analyses. Mechanical loads include forces,



Features continued

Understand model behavior easily with comprehensive graphical postprocessing tools

Full simulation scalability from Solid Edge Simulation Express or Solid Edge Simulation through to Femap

Based on proven Femap modeling technology with the industry standard NX™ Nastran solver

pressures and effects due to body rotation and gravity. Solid Edge Simulation facilitates load and constraint application with Quick Bar input options and handles for direction and orientation definition.

Analyzing assemblies

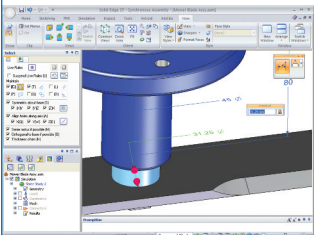
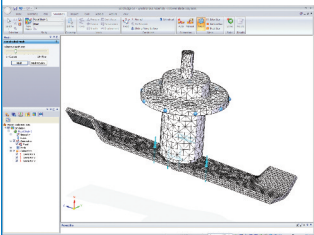
Connect assembly model components together fast. Assembly component interaction can be a glued connection between components or linear contact based on an iterative linear solution. Contact detection between components can be determined automatically, or connectors defined individually through manual face selection. Assembly materials and properties can be applied manually, selected from a material library or inherited from the geometry model by default, and the included NX Nastran solver assures realistic assembly component interaction that provides a robust solution.

Analysis types

You can obtain the results due to a static loading, find the natural frequencies of vibration or determine buckling loads of a design using the industry accepted NX Nastran solver. Re-use of finite element model loads and constraints is as easy as dragging and dropping from one study to another.

Analysis scalability

Simulation functionality within the Velocity Series™ software portfolio scales from Solid Edge Simulation Express (formerly Femap Express) for individual parts, or Solid Edge Simulation, which extends analysis to assemblies, all the way to Femap with NX Nastran that allows you to define and analyze complete systems. The complete line of products provides a scalable upgrade path for users that are required to solve more challenging engineering problems. Complete geometry and finite element models with boundary conditions and results are easily transferrable from Solid Edge to Femap, where more advanced analyses can be employed if desired.



Postprocessing

Interpret and understand the resulting model behavior quickly with the comprehensive graphical postprocessing tools. Model results can be displayed in a number of forms, including color and contour plots, which can be continuous, displayed as distinct contour bands or by element, and displacement and mode shapes that can be animated. Also available are max/min stress markers and a probe tool with results call-out boxes. With Solid Edge Simulation's comprehensive postprocessing functionality you can quickly identify problem areas for potential design revision, and generate an HTML report of simulation model information and final results.

Design updates

Post analysis you can make any required design updates quickly and easily. Synchronous Technology lets you make history-free feature-based model changes at will, which drastically speeds up the model refinement process. Furthermore, Solid Edge Simulation maintains associativity between the CAD and FE models, and makes sure that your applied loads and constraints are maintained for all geometry model changes.

► For more information, contact your local Velocity representative:

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