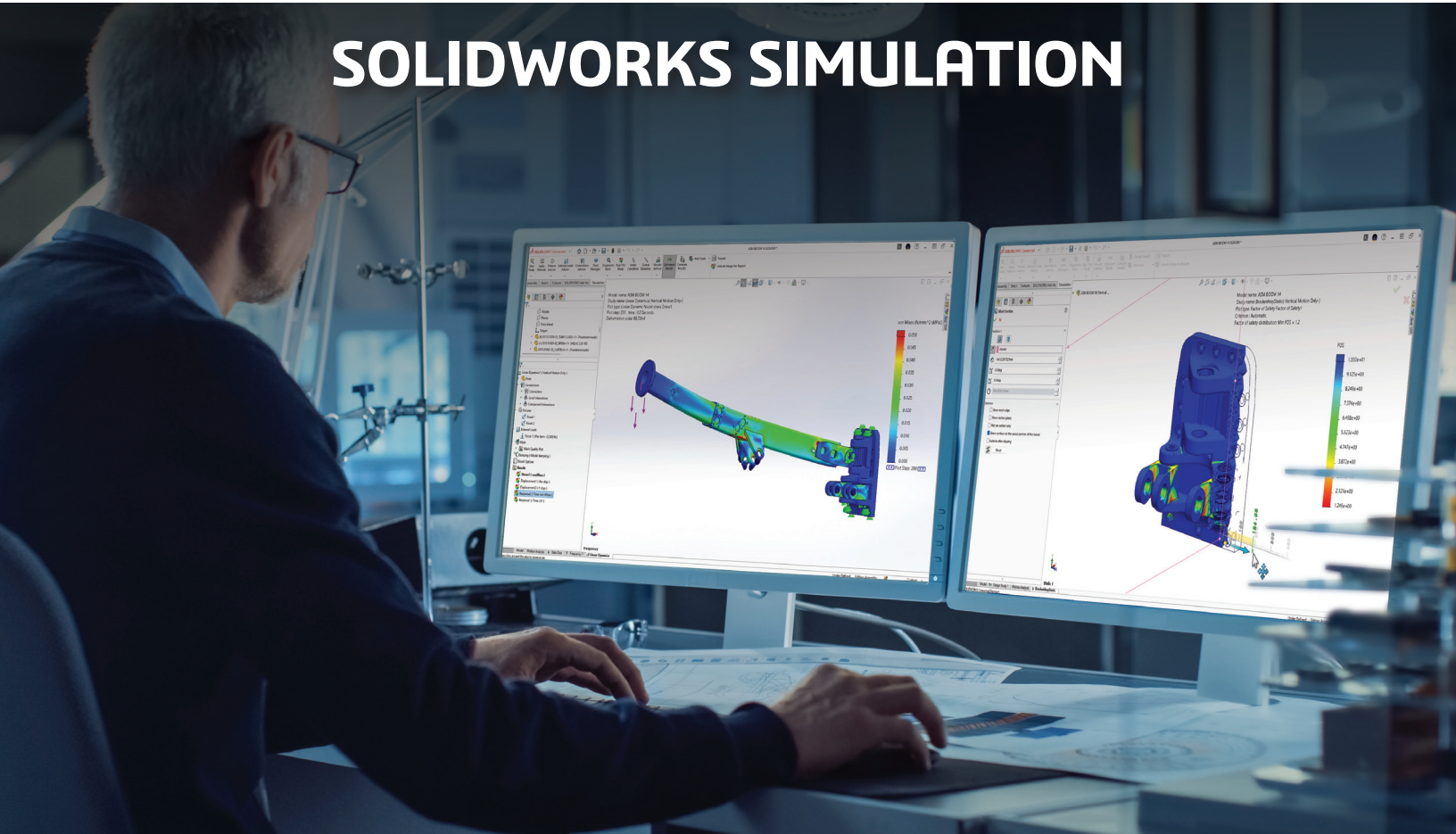


SOLIDWORKS SIMULATION



BRING YOUR PRODUCTS TO MARKET FASTER AND WITH LESS PROTOTYPING

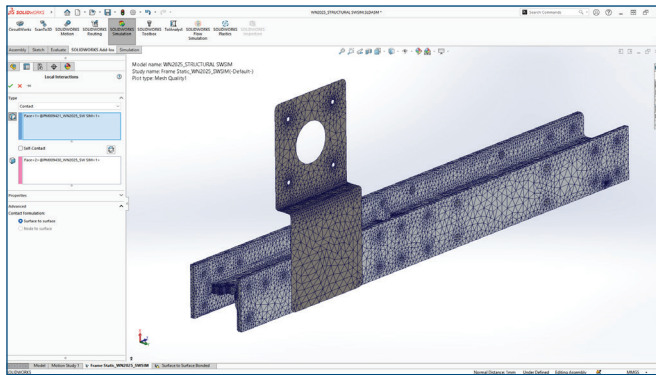
Catch failures early and optimize your designs, reducing prototypes, material usage, and overdesign with simulation tools built into SOLIDWORKS®.

OVERVIEW

SOLIDWORKS Simulation is an easy-to-use portfolio of structural analysis tools that uses NAFEMS-validated Finite Element Analysis (FEA) solvers to predict a product's real-world physical behavior by virtually testing CAD models. Fully embedded within the SOLIDWORKS 3D CAD interface, it enables designers and engineers to subject their designs to real-world conditions, raising product quality while reducing the cost and time spent on physical prototyping and testing.

The portfolio scales across three tiers — Standard, Professional, and Premium — covering everything from entry-level linear static and fatigue analysis to nonlinear and dynamic response, thermal studies, and topology optimization. By delivering results directly within the familiar design environment, SOLIDWORKS Simulation supports a concurrent engineering approach: validating performance, identifying failure risks, and optimizing designs early in the design phase, long before the prototype is in production.

KEY CAPABILITIES



Define contact conditions and validate assembly performance without leaving your design environment.

Embedded: Work natively within SOLIDWORKS without switching tools

- Run simulations fully embedded in the SOLIDWORKS 3D CAD interface.
- Propagate design changes to simulation studies automatically through full model associativity, keeping analysis current as the design evolves.
- Access SOLIDWORKS materials and configurations directly in each study, with results overlaid on your 3D geometry in context.
- Export SOLIDWORKS Simulation results in eDrawings® format for sharing with colleagues and stakeholders.

Precise: Validate part and assembly performance from the design phase

- Compute stresses, strains, displacements, and factor of safety across parts and assemblies under static loading conditions.
- Predict where fatigue failures will initiate and how many load cycles a component can withstand before failure.
- Set up realistic assembly connections using bolts, pins, springs, bearings, and edge and spot welds, without simplifying geometry.
- Simulate time-based and event-based rigid body assembly motion, extract the resulting component and connector loads, and feed them into a structural analysis for a complete investigation.

Comprehensive: Cover thermal, frequency, buckling, and impact analysis

- Compute steady-state and transient heat distribution and heat flux across a design, and pass those thermal loads directly into structural studies.
- Identify resonant frequencies and mode shapes, determine the load at which slender components buckle, and simulate drop impact response for parts and assemblies.
- Verify pressure vessel designs through linearized stress analysis and isolate critical assembly regions for detailed investigation using submodeling.

Optimized: Generate leaner designs and hit performance targets faster

- Automatically produce material-efficient design alternatives using topology optimization that satisfy stress, stiffness, and frequency requirements – without overengineering.
- Run goal-driven parametric studies to find the configuration that minimizes mass, stress, or deflection based on user-defined performance targets.

Advanced: Analyze nonlinear behavior and complex dynamic response

- Evaluate the structural response to vibration, shock, and dynamic loading across four study types: modal time history, harmonic, random vibration, and response spectrum.
- Model material behavior beyond the elastic limit through nonlinear static and dynamic analysis: post-yield metals, rubbers, plastics, large deformations, and sliding contact, and calculate residual stresses and permanent deformation.
- Assess multilayer composite laminates under structural loading, with ply-level stress and interlaminar performance results.

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