SEACAD

Focused, Proven, Credible.

SOLIDWORKS Simulation Packages

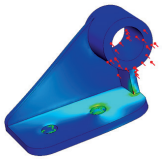
	SOLIDWORKS SIMULATION STANDARD	SOLIDWORKS SIMULATION PROFESSIONAL	SOLIDWORKS SIMULATION PREMIUM
Ease of Use/Intuitiveness/Concurrent Engineering			
Fully Embedded in SOLIDWORKS 3D CAD	✓	✓	✓
SOLIDWORKS Material Properties Support	✓	✓	✓
Connectors & Hot Spot Detection*	✓	✓	✓
Mass Properties for Simulation Models*		✓	✓
Equation Driven Results		✓	✓
Create Body from Deformed Shape		✓	✓
Finite Element Analysis			
Linear Static Stress Analysis for Assembly	✓	✓	✓
Time-Based Mechanism Motion Analysis	✓	✓	✓
Design Studies	✓	✓	✓
Trend Tracker	✓	✓	✓
Fatigue Analysis	✓	✓	✓
Design Optimization		✓	✓
Event-Based Motion Analysis		✓	✓
Topology Optmization		✓	✓
Frequency Analysis		✓	✓
Buckling Analysis		✓	✓
Structural Thermal Analysis		✓	✓
Drop Test Analysis		✓	✓
Pressure Vessel Design Analysis		✓	✓
Sub-Modeling Analysis		✓	✓
Load Case Manager		✓	✓
Non-linear Analysis			
Transient (Time Dependent Loads)			✓
Material Nonlinearity			✓
Large Displacement/Strain Problems			✓
Composites Analysis			✓

SYSTEM REQUIREMENTS
Windows® 10 or newer (64-bit), Dual core CPU; Quad core recommended, 16GB RAM; 32GB or 64GB recommended, 2GB free disk space; 5GB recommended, 2GB or more GPU RAM; 4GB recommended, NVIDIA® graphics card: NVIDIA Quadro® series chip; Dual-GPU setup with at least NVIDIA Maxwell™ cards for the best experience, NVIDIA driver version 460 (or newer) recommended, NVIDIA driver support for CUDA® 9.0 or newer required, HDR Light Studio connection: HDR Light Studio v5.3.3 or newer, except v5.4, 4GB of video memory or more required for the Denoiser feature

	SOLIDWORKS SIMULATION STANDARD	SOLIDWORKS SIMULATION PROFESSIONAL	SOLIDWORKS SIMULATION PREMIUM
Dynamic (Forced Vibration) Analysis			
Shock/Impact Loads			✔
Harmonic Analysis			✔
Random Vibration Analysis			✔
Response Spectrum Analysis			✔
Estimate Component Life based on Dynamic Loading			✔
Nonlinear Dynamics			✔

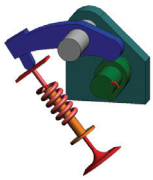
Linear Static Stress Analysis for Assembly

Linear Static analysis calculates displacements, strains, stresses, and reaction forces on parts/assembly under the effect of applied loads. Compare product behaviour under static loads to determine critical uses cases and to ensure adequate design strength.



Time-Based Mechanism Motion Analysis

To simulate and analyse the effects of motion elements (e.g. forces, springs, dampers, and friction) accurately on an assembly, Motion Analysis uses strong kinematic solvers, accounts for material properties, mass and inertia in the computations, then uses the results as a loading for a structural assembly simulation.

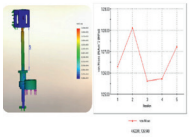


Design Studies

SOLIDWORKS Simulation provides powerful tools to automate different iterations and find the best design. It runs the study using various combinations of the values, and reports the output for each combination so you can find the best design scenario for your product.

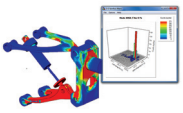
Trend Tracker

The Trend Tracker capability can easily determine and trace the impact of your design changes on the component performance while you design. With the analysis results, it can change the thickness, material, and the geometry of a component to meet the product requirements and and achieve better performance and quality.



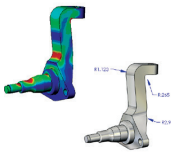
Fatigue Analysis

Fatigue analysis examines how repeated or random load cycles can cause structural failure (also known as metal fatigue). Fatigue Analysis can predict component fatigue failures during the design phase with CAD-embedded SOLIDWORKS Simulation. You can then adjust your design or define a preventive maintenance schedule to reduce warranty costs and maximize product life.



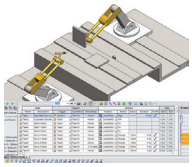
Design Optimization (based on Simulation Data)

Structural optimization analysis during design can help to achieve the best available frequency, strength-to-weight, or stiffness performance for your designs which can avoid the making of costly prototypes, eliminate rework and save development cost. SOLIDWORKS Simulation simplifies structural optimization with a goal-driven design approach to parametrically alter a design so that it meets defined structural goals.



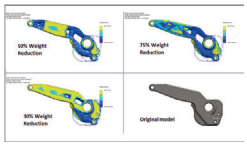
Event-Based Motion Analysis

Event-based motion studies are defined by a set of motion actions casued by triggering events. With this feature, you can validate the sequencing of the design to ensure correct operation, product quality, and safety. See how your product would move in reality and measure the forces and loads while you design, helping you correctly size the motors and structure as well as confirming the timing.



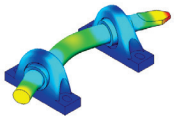
Topology Optimization

Explore design iterations of a component that satisfy a given optimization goal and geometric constraints with topology study. Start with a maximum design space (which represents the maximum allowed size for a component) and considering all applied loads, fixtures, and manufacturing constraints, the topology optimization seeks a new material layout, within the boundaries of the maximum allowed geometry by redistributing the material. The optimized component satisfies all the required mechanical and manufacturing requirements.



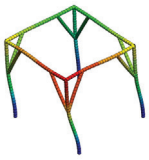
Frequency Analysis

Investigate the natural frequencies of a design – with and without loads and boundary conditions efficiently and ensure the natural modes of vibration are away from environmental forcing frequencies, indicating that the design will meet the required service life.



Buckling Analysis

Buckling analysis calculates the critical failure loads of slender structures under compression. Understanding the buckling strength of a design is important to predict possible failure modes or types of analysis required to best understand performance.

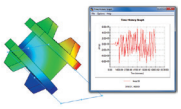


Structural Thermal Analysis

Thermal analysis calculates the temperature and heat transfer within and between components in your design and its environment. This analysis is crucial as many materials consist of temperature dependent properties. Compare temperatures, temperature gradients, and heat flow based on heat generation, conduction, convection, and radiation conditions can ensure the best design option and avoid undesirable thermal conditions.

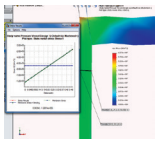
Drop Test Analysis

Drop test studies evaluate the effect of dropping the model on a rigid floor or flexible target. You can specify the dropping height or the velocity at the time of impact in addition to gravity, and SOLIDWORKS Simulation solves the dynamic problem as a function of time.



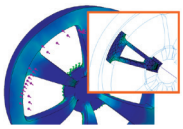
Pressure Vessel Design Analysis

In a pressure vessel design study, you combine the results of static studies with specified factors to view the results of various loading scenarios quickly. In addition, when using a solid mesh, the stress linearization tool will separate the bending and membrane components.



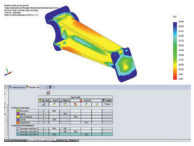
Sub-modeling Analysis

Create accurante sub-model studies easily for specific areas within your design that automatically utilize loads and boundary conditions applied to the full 3D model. It enables you to accurately test large and complex 3D models by performing precise simulation analysis for specific areas of interest efficiently.



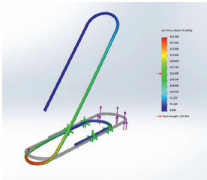
Load Case Manager

Load Case Manager allows the evaluation of design for multuple load cases by defining secondary load combinations from primary load definitions quickly and evaluate the effects of the various load combinations on the model. You can analyze stresses and deformations under general conditions quickly while creating high quality designs.



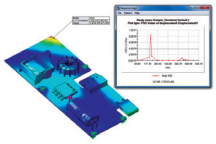
Non-linear Analysis

Non-linear stress analysis calculates the stresses and deformations of products under the most general loading and material conditions such as non-linear materials like rubber or metal, time-dependent loads and large component deformations beyond their yield point. Non-linear analysis is a more complex approach, but results in a more accurate solution than linear analysis if the basic assumptions of a linear analysis are violated.



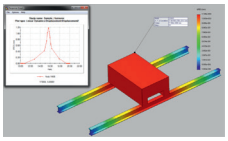
Dynamics (Forced Vibration) Analysis

Dynamic analysis can incorporate frequency, impact, and drop tests. With the calculated component displacement over time, the stresses, velocities, and accelerations can be determined together with the natural modes of vibration using a choice of integrated studies, including Modal Time History, Harmonic Response, Random Vibration Response and Response Spectrum analysis.



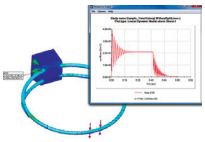
Estimate Component Life based on Dynamic Loading

Vibration Fatigue refers to the estimation of fatigue life where the loading and response are from dynamic or vibration loading conditions. Fatigue damage assessment for the products or components that operate in a vibration environment is estimated in the frequency domain based on the statistical properties of the response stress.



Non-linear Dynamics

Non-linear Dynamics directly tackle the complex coupled system of equations of motion by solving the problems with dynamics or vibration loads coupled with the non-linear conditions in the component.



SOLIDWORKS allowed us to better present our designs to sales and customers in 3D model making it easy to visualize our initial design concepts. We are able to give 3D data to our suppliers making fabrication more accurately and shorten lead-time.

Ms. Jessica Toh, Manager

Customer Success Story – UAV Engines Ltd

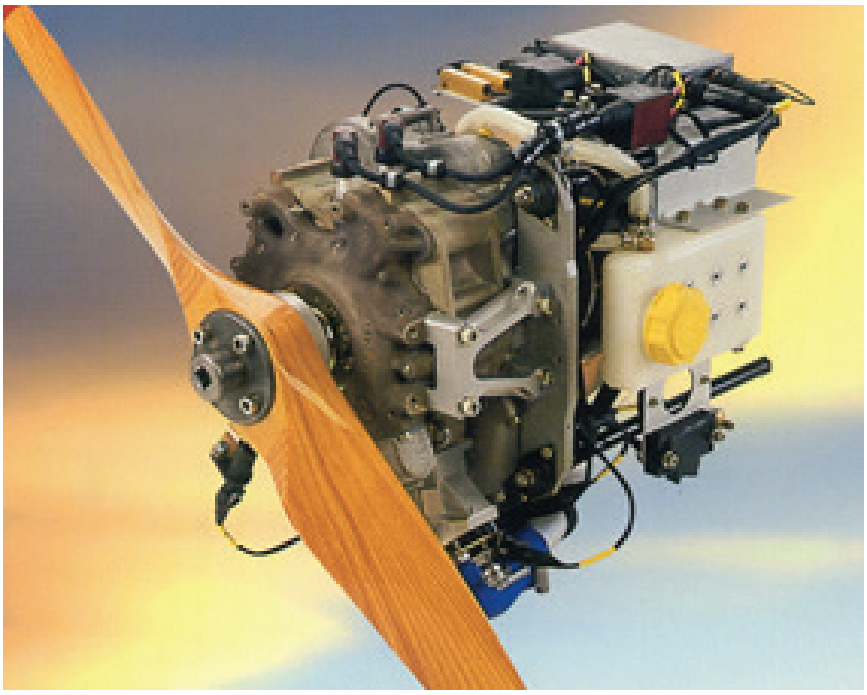


Image courtesy of UVA Enginers

"We looked at several 3D packages including Pro/Engineer and Solid Edge and SolidWorks CAD software had the best interface, ease of use, performance and cost. We also knew that we could adopt SolidWorks much faster than the other software because its more intuitive."

- Nathan Bailey, Operations Manager

UVA Engines Ltd

Since 1992 UAV Engines has developed ever lighter engines that carry UAVs into harsh environments for predominantly military applications.

Challenge

Design lightweight, efficient and durable engines to carry unmanned surveillance aircrafts into harsh environments.

Products Used

- SOLIDWORKS Simulation
- SOLIDWORKS Simulation Professional
- SOLIDWORKS Flow Simulation
- SOLIDWORKS Workgroup PDM
- SOLIDWORKS Standard
- SOLIDWORKS Professional
- SOLIDWORKS Motion

Benefits

Designed better performing engines that carry aircrafts farther and through harsher environments than those designed in 2D. Reduced development time by more than 50%.

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