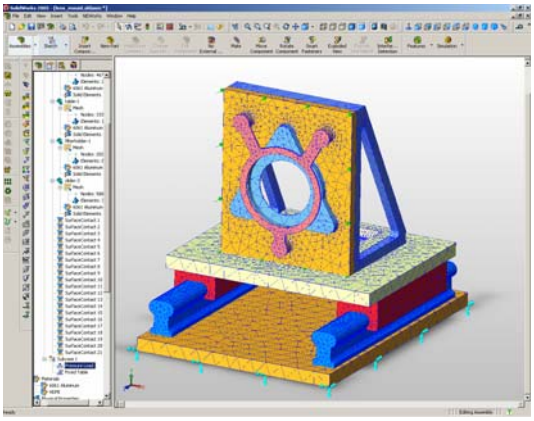
NEi Works *for SolidWorks*

Features

Overview

NEi Works provides SolidWorks users with an embedded finite element modeling tool. It features the familiar SolidWorks look and feel for all menus and functions, providing seamless integration between design and analysis. NEi Works features true geometry associativity, which means your loads, boundary conditions and even meshes are updated interactively whenever changes are made in SolidWorks.

With NASTRAN being one of the most widely used solutions, SolidWorks users can now communicate their FEA data to most standard pre- and post-processors through support of the NASTRAN file format. This provides versatility to a product which is already easy to use and backed by the renowned NASTRAN solution.



Capabilities:

Model Geometry Access:

- Part geometry data is accessed directly through SolidWorks API
- Data accessed for finite element mesh generation and application of loads and boundary conditions
- Supports SolidWorks type surfaces, such as mid-surfaces and sheet metal
- Supports assembly analysis

Meshing:

- Global and local controls applied to part geometry with default sizing
- Mesh control on arbitrary user defined regions
- Sketch line or curve meshing
- Free surface meshing: quads or triangles
- Continuous shell (quad or tri) meshing
- Auto mesh, loads and constraints update with geometry changes
- Mesher status window and progress bar
- Display/hide shell element normals
- Reverse normals for shell elements
- Mesh validation checks - distortion, Jacobian, and skew
- Display/hide beam element orientation
- Display/hide beam element and shell element cross section
- 1D element cross section property definition
- Combined Shell (2D) and Beam (1D) meshing

Assembly Connectors:

- True surface contact
- Automatic contact
- Thermal contact resistance

Loads and Boundary Conditions:

- Uniform pressure and force on faces, edges and vertices
- Directional pressure and force
- Acceleration loads (gravity)
- Enforced motions: acceleration, velocity, displacement (rotational/translational)
- Temperature, default temperature and heat flux
- Symmetric, antisymmetric, axisymmetric boundary conditions
- Fixed constraints on faces, edges and vertices
- Directional and prescribed constraints
- Thermal constraints
- Thermal body loads
- Initial temperature conditions

- Custom colors and sizes for loads and constraints
- Loads defined using edges
- Convection
- Conduction
- Radiation
- Heat generation
- Rotational velocity / acceleration
- From output (thermal)
- Load variation using arbitrary 3D scale factors

Element Library:
- 1D line (CBEAM, CBAR, CPIPE)
- 2D linear shell (CQUAD4 and CTRIA3)
- 2D parabolic shell (CQUAD8 and CTRIA6)
- 3D linear and parabolic tetrahedron (CTETRA)
- Composites with plates and shells
- Surface to surface contact with manual or automatic recognition of surfaces
- Concentrated mass
- Connectors:
  - Spring (CBUSH)
  - Rigid elements
  - Rod (CROD)
  - Nonlinear cable

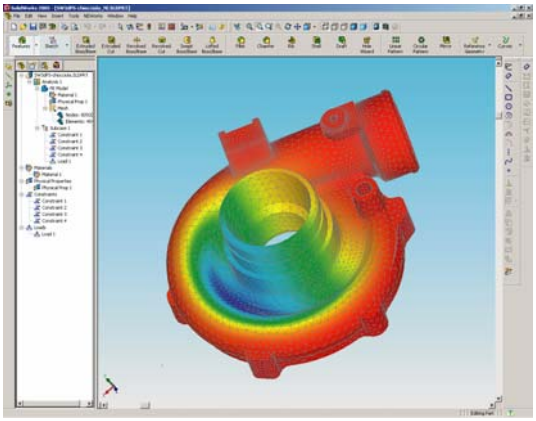
Materials:
- Isotropic
- Anisotropic (2D & 3D)
- Orthotropic (2D & 3D)
- Nonlinear materials
  - Nonlinear elastic
  - Elasto-plastic
  - Plastic
- Hardening
  - Isotropic
  - Kinematic
  - Combined
- Yield
  - Von Mises
  - Tresca
  - Mohr-Coulomb
  - Drucker-Prager
- Custom stress-strain curve
- Hyperelastic
  - Neo-Hookean
  - Mooney-Rivlin
  - Ogden
  - Yeoh
  - Generalized polynomial
- Temperature dependent property support

Material Orientation:
- Vector projection
- Curve tangent
- Rotated curve tangent
- Translated curve tangent
- Surface U and V directions

Properties:
- 1D beam (PBEAM/PBEAML) and bar (PBAR/PBARL)
- 2D plate (PSHELL) and composite (PCOMP)
- 3D solid (PSOLID)
- Contact (BSCONP)

Surface Contact:
- Automatic surface contact generation
- General, welded, slide, rough, offset weld and RBE3 element contact types
- Static friction

Coordinate Systems:
- Cartesian, cylindrical and spherical coordinate systems
- Referencing global assembly, part or custom coordinate systems
- Display toggles



User Interface:
- Seamless integration with SolidWorks GUI
- Menu support for all features
- Toolbar shortcuts
- Modern tree view layout
- Query display of real time information on nodes and elements
- Highlight specific nodes and elements on the model
- Total number of nodes/elements displayed in assembly tree
- Section view for parts and assemblies

- Dynamic update of loads, constraints, and rigid bodies

Analysis Types:
- Linear statics
- Normal modes
- Linear buckling
- Nonlinear static
- Thermal stress
- Prestress static
- Composite
- Contact analysis in assemblies
- Linear steady state heat transfer
- Optimization
- Modal transient response
- Direct transient response
- Direct frequency response
- Modal frequency response
- Nonlinear steady state heat transfer
- Nonlinear transient heat transfer
- Nonlinear transient response

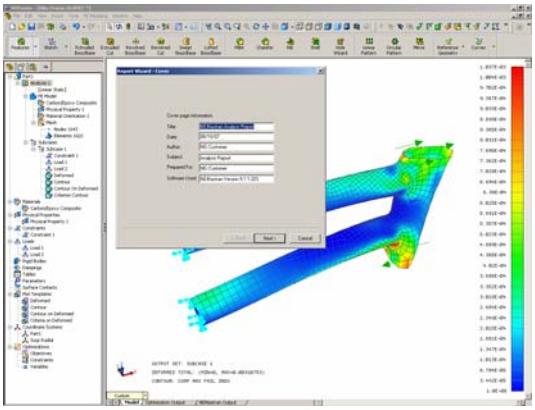
Composite Analysis:
- Various failure theories supported:
  - Hill
  - Hoffman
  - Tsai-Wu
  - Max. stress
  - Max. strain
  - NASA LARC02

Optimization Analysis:
- Design objectives to minimize, maximize or reach target values
- Parametrically update geometry dimensions
- Optimize weight, stress, material properties, temperature, eigenvalue, plate and laminate properties thickness

Drop Testing Analysis:
- Automatic impact wizard
- Acceleration and contact direction input
- Time stepping automatically calculated based on natural frequency

Post-Processing:
- Stress, deformation plots
- Principal and directional stress plot
- Strain plot
- Resonant frequencies, mode shape plots
- Temperature, heat flux plots
- Iso-surfaces
- Results across composite laminates
- Partial results generation for modal and transient analysis types
- Export Nastran input deck to other FEA systems
- Output within SolidWorks view with sensitive Help and analysis control, such as pausing and solution termination
- Import results using Femap Binary Neutral file format (FNO)
- Customizable material library
- Single and multi-set animations
- Max/min labels
- Results processed on selected parts of assemblies
- Dynamic result data display during nonlinear analysis
- Loads and constraints shown on deformed plots
- XY plot capability
- Section cut capability

Report Generation:
- HTML formatted reports for linear static analysis
- Customizable report format
- Step by step wizard for report generation process
- Includes standard model data



Graphics:
- OpenGL graphics taking advantage of the latest Computer Graphics chips
- 3D dynamic pan, zoom and rotation
- Hidden line and wireframe display
- Light source shading and transparency
- Multi-view display of Part/Assemblies

Compatibilities:

- Nastran input file can be sent to any Nastran FE Solver including NEi Nastran, NX Nastran, or MSC.Nastran
- Binary results file in OP2 format usable by all Nastran solvers and wide variety of post-processors
- Part and Assembly geometry is fully compatible with SolidWorks' Parts and Assemblies

International Languages:

- GUI: English, Japanese, Italian, French
- Technical documentation: English

System Requirements:

- Intel Pentium® 4 or AMD based PC as a minimum, Intel Core™ i7, Xeon, AMD Opteron recommended
- 1 GB RAM minimum, more recommended
- 600 MB free hard disk space for installation, more required for simulation models
- Microsoft Windows XP® Professional with SP2 or greater, Vista base release or with any SP, and Windows 7 with SP0, 32-bit and 64-bit
- Compatible with SolidWorks 2009 SP0, but SP4 recommended, and SolidWorks 2010 SP0, but SP1 recommended for Windows 7

NEi Software, Inc. is committed to the success of our customers. Detailed documentation, customized on-site training, and comprehensive technical support ensures that you will see immediate return on your investment.

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