NEiWorks *for SolidWorks*

Features

Overview

NEiWorks 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. NEiWorks 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.

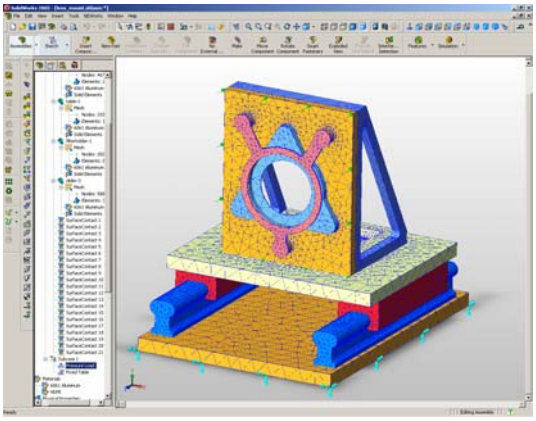
Capabilities:

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
- Free surface meshing: quads or triangles
- Automatic solid meshing with tetrahedral elements
- Model can have simultaneous shell and solid meshes
- Mesh control on arbitrary user defined regions, local size at vertex, and on edges
- Mesher status window
- Mesh controls that limit the sizing and shape of elements



Assembly Connectors:

- True surface contact
- Thermal contact resistance

Loads and Boundary Conditions:

- Loading applied on faces, edges and vertices
- Uniform pressure and force on faces
- Directional and non-uniform pressure and force
- Force on edges and vertices
- Acceleration loads (gravity)
- Enforced displacement and rotations
- Temperature, default temperature and heat flux
- Symmetric, antisymmetric, axisymmetric, cyclic symmetric boundary conditions
- Fixed constraints on faces, edges and vertices
- Directional and prescribed constraints
- Thermal constraints

Element Library:

- 3D solid: tetrahedron both linear or parabolic
- 2D shell: quadrilateral and triangular plates, membranes
- Rigid body elements

Materials:
- Isotropic
- Orthotropic
- Nonlinear materials
  - Nonlinear elastic
  - Elasto-plastic
  - Plastic
- Hardening
  - Isotropic
  - Kinematic
  - Combined
- Yield
  - Von Mises
  - Tresca
  - Mohr-Coulomb
  - Drucker-Prager
- Custom stress-strain curve

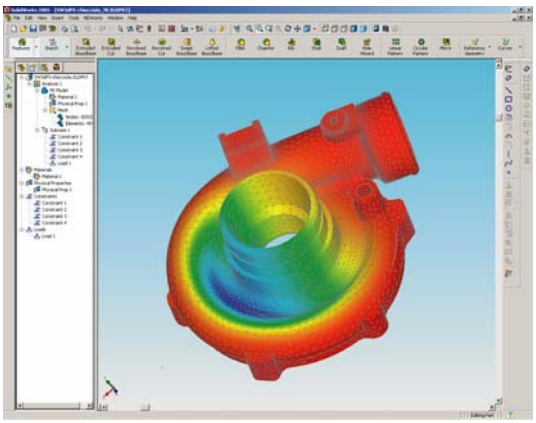
Material Orientation:
- Vector projection
- Curve tangent
- Rotated curve tangent
- Translated curve tangent
- Surface U and V directions

Properties:
- Solid and plane
- Different plane property for each face
- Composite laminate with various failure theories:
  - Hill
  - Hoffman
  - Tsai-Wu
  - Max. stress
  - Max. strain
  - NASA Larc02

Surface Contact:
- Automatic mate dependent contact pair generation
- Free and welded contact types
- Static friction

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

User Interface:
- SolidWorks look and feel
- Seamless integration with SolidWorks GUI
- Modern tree view layout



Analysis Types:
- Linear Statics
- Linear Dynamics
- Linear Buckling
- Nonlinear Stress
- Nonlinear Buckling
- Nonlinear Event Simulation
- Thermal Stress
- Prestress Static
- Prestress Normal Modes
- Composite
- Contact Analysis in Assemblies
- Linear Steady State Heat Transfer

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
- Export to other FEA systems
- Customizable material library
- Output within SolidWorks view with sensitive Help and analysis control, such as pausing and solution termination

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

Editor:

- Fully integrated and customizable Nastran Editor controls program operation and provides results summary data through an easy to use GUI
- Features tabbed windows to give immediate access to all input and output files
- Field markers make manual editing simple and increase productivity dramatically
- Complete online documentation and context sensitive help
- Permits batch queuing of jobs for sensitivity and configuration trade studies

Advanced Features (available through the Editor):

- Spring elements
- 1D elements: rods, beams and trusses
- Anisotropic and temperature dependent materials
- Initial strain analysis
- Inertial relief analysis
- Tabular results listing
- Detailed HTML report customization
- Single and multi-load set animations
- Interactive data query with mouse
- Parameter setup and control

Compatibilities:

- Nastran input file can be sent to any Nastran FE Solver including NEiNastran, NX Nastran, or MSC.Nastran.
- Binary results file in OP2 format usable by all Nastran solvers and wide variety of post-processors.

International Languages:

- Japanese and Italian versions of NEiWorks available now; other languages will be added in the near future

Noran Engineering, 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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