PTC® the product development company®

Data Sheet

Creo™ Elements/Direct™ Finite Element Analysis

SIMULATE REAL-WORLD STRESSES ON YOUR DESIGN

Formerly CoCreate®

Creo Elements/Direct Finite Element Analysis offers an extensive set of finite element analysis (FEA) capabilities for engineers and designers.

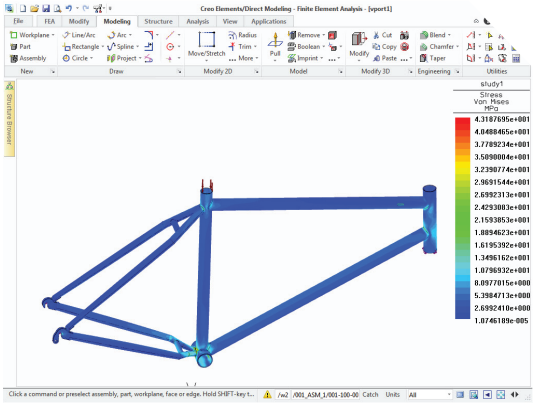
Based on MSC Software Corporation's Nastran® and Patran® solutions, Creo Elements/Direct Finite Element Analysis gives you all the power you need to simulate real-life mechanical and thermal stresses on products, directly within the Creo Elements/Direct Modeling 3D CAD system.

Faster identification and resolution of design issues helps companies transition from a stage-gate process for design and analysis to a more efficient product development process, where digital simulation occurs as part of the daily design activity.

Easily perform a variety of FEA studies for structural, buckling, thermal, and frequency analysis, using various working load and boundary conditions that you apply to your product design.

Key benefits

- Achieve faster realization of optimal designs, avoid both failure-prone and over-engineered components, and reduce physical prototyping costs.
- Identify areas within a product that will be prone to failure. Issues can be resolved early in the design process, increasing design quality, and saving costs and time.
- Conduct extensive trade-off studies upfront in the development process, and yield downstream benefits, including increased design quality, reduced time-to-market, reduced cost of goods sold, and reduced warranty exposure.



Run Creo Elements/Direct Finite Element Analysis simulations on your virtual product model.

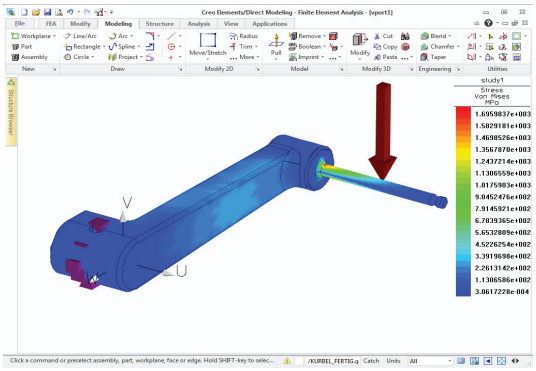
Features and specifications

Complete and fully integrated solution

- Perform linear and static analyses
- Execute all analyses within the Creo Elements/Direct Modeling environment
- Set up and store loads and boundary conditions, and assign material types directly with the part or assembly data
- Store multiple studies of the same part or assembly data
- Leverage automatic meshing and solving for parts and assemblies
- Full-color visualization of part, clearly showing stress, strain, displacement, etc.
- Store results with the part
- Animate results and document using HTML

Analysis cases

- Analyze stress levels, displacements, and resonant frequencies of designs. Supported cases include:
  - Linear static structural analysis
  - Linear buckling
  - Normal modes
- Analyze thermal cases:
  - Steady state thermal
  - Solving for temperature and flux
  - Loads and Boundary Conditions (LBCs)



Easily detect weaknesses in your design before performing expensive tests on physical prototypes.

- Assign LBCs directly to part or assembly, including:
  - Vertex, edges, and face loads
  - Spin, gravity, acceleration, and part temperature
  - Face pressure loads
  - Translational constraints and enforced displacements (XYZ) for vertex, edge, or face
  - Heat flow, heat generation, free convection, fixed temperature

Materials

- Leverage the standard database, which includes over 900 commonly used materials, such as multiple types of steel, aluminum, and plastics
- Add more materials and material parameters

Meshing

- Generate volumetric meshes automatically, using technology provided by MSC Software Corporation – Tetrahedral linear or quadratic order adaptive h-element technology – P-element technology
- Automatically create shell-elements tailored for sheet metal part analysis

- Generate surface mesh with triangular or quadratic h-elements
- Export mesh with or without LBC data as a PATRAN-neutral file
- Apply mesh conditions to the part or assembly, and control local mesh density

Solving

- Solve cases with unlimited nodes and unlimited mesh size. Solving based on the latest h- and p-elements technology from industry-leader MSC Software Corporation

Prerequisites

- Creo Elements/Direct Modeling

Platform Requirements

Creo Elements/Direct Finite Element Analysis-supported operating systems:

- Windows® 7 32-bit and 64-bit Editions of Ultimate, Enterprise, and Professional
- Windows Vista® 32-bit and 64-bit Editions of Ultimate, Enterprise, and Business
- Windows XP Professional 32-bit and 64-bit Editions

For the most up-to-date platform support information, visit:
PTC.com/partners/hardware/current/support.htm

For more information, visit:
PTC.com/products/creo-elements-direct

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