PTC®

PTC Creo® Advanced Simulation Extension

PTC Creo Advanced Simulation Extension expands the capabilities of PTC Creo Simulate and allows the study of how advanced, nonlinear effects should influence the product design.

PTC Creo Simulate and PTC Creo Advanced Simulation Extension have the same user interface, workflow and productivity tools that are standard throughout the PTC Creo family. The combination of PTC Creo Simulate and PTC Creo Advanced Simulation Extension can be used as a standalone application or as an extension of PTC Creo Parametric.
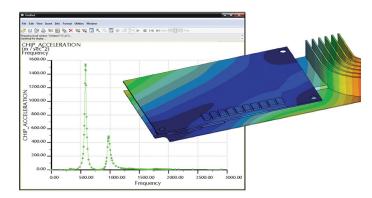
Features and Specifications

Includes all the features of PTC Creo Simulate, plus the following:

Analysis Capabilities

- Nonlinear Static Structural Analysis

    - Large Displacements and Strains

    - Sliding Contact

    - Hyper-elastic Materials

    - Elasto-plastic Materials

    - Nonlinear Springs

    - Boundary Conditions applied sequentially

    - Snap-through

- Dynamic Structural Analysis

    - Time Response

    - Frequency Response

    - Random Response

    - Response Spectrum

- Pre-stress Structural Static Analysis

- Pre-stress Structural Modal Analysis

- Nonlinear Steady State Thermal Analysis

    - Temperature Dependent Convections

    - Gray Body Radiation

    - Temperature dependent Material Properties

    - Boundary Conditions applied sequentially

- Transient Thermal Analysis

The software gives you the power to perform dynamic frequency response analyses.

Convergence

- Adaptive Nonlinear iterations

- Adaptive Transient solution

Structural Boundary Conditions

- Preloads of Bolts

- Base Excitation for Dynamic Analyses

    - Uniaxial

    - Translations and Rotations

    - Translations at 3 Points

- Frequency Dependence of Load Sets for Frequency Response

- Time Dependence of Load Sets for Time Response

- Power Spectral Densities for Random Response

Thermal Boundary Conditions

- Transient Heat Loads

- Traveling Heat Loads

- Transient Convection Conditions

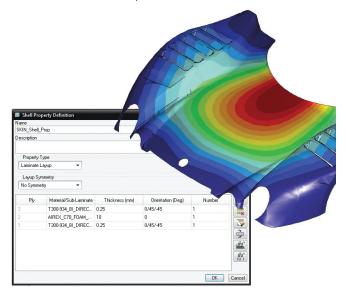- Radiation Conditions

Materials

- Non-isotropic Material Properties

    - Orthotropic

    - Transversely Isotropic

- Transversely Isotropic Material Failure Limits:

    - Supported Criteria: Tsai-Wu, Maximum Stress, Maximum Strain

- Material Orientation of volumes and surfaces

- Hyper-elastic Stress-Strain Response

    - Automatic fitting of experimental data

    - Supported models: Arruda-Boyce, Mooney-Rivlin, Neo-Hookean, Polynomial Order 2, Reduced Polynomial Order 2, Yeoh

- Elasto-plastic Stress-Strain Response

    - Automatic fitting of experimental data

    - Supported models: Linear Hardening, Power Law, Exponential Law

    - Thermal Softening effect

- Temperature dependent Thermal Conductivity

Element Types and Idealizations

- Laminate Shells

    - General Layup Editor

    - Direct import of Laminate Stiffness

- Advanced Springs

    - General (nonlinear) Force-Deflection Curve

    - General Stiffness Matrix, including automatic calculation of off-diagonal coupling terms

- Advanced Concentrated Masses

    - General Moments of Inertia

    - Mass from Component

Quickly and easily define laminate shell properties to realistically simulate product behavior.
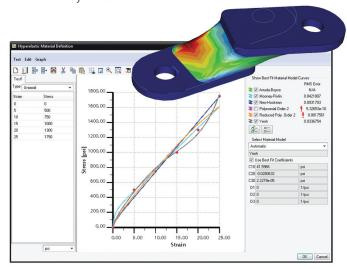
Meshing Tools

- Mapped meshed regions
- Prismatic regions
- Thin solid regions

Connections

- Advanced Rigid Links
- Weighted Links

2D Analysis

- 2D Plane Stress
- 2D Plane Strain
- 2D Axi-symmetric

PTC Creo Advanced Simulation Extension simulates nonlinear, hyper-elastic behavior and allows you to define material properties using your own test data.

Results

- Measure Graphs vs. Time, Frequency, Load Step
- Measures for Dynamic Analyses
  - At Each Step
  - Maximum over Interval
  - Time at which maximum occurs
- Measures for Transient Thermal Analyses
  - At Each Step
  - Maximum over Interval
  - Time at which maximum occurs

Language Support

- English
- German
- French
- Japanese
- Russian
- Simplified Chinese

Visit the **PTC support page** for platform support and system requirements.

For more information, visit: **PTC.com**/product/creo