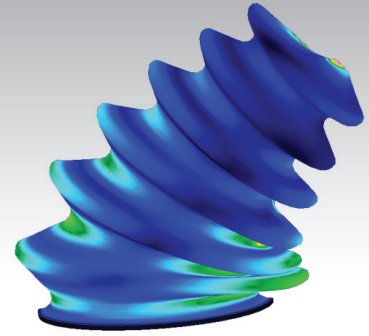


MSC AFEA

The Power of Marc and Patran in an Integrated Environment



Overview

MSC AFEA is a package of two industry leading products provided by MSC.Software, namely the nonlinear solver Marc and the CAE modeler Patran. By providing these two advanced products in an integrated environment, MSC.Software offers high-end simulation and nonlinear analysis capabilities at an affordable price. Together they allow the user to perform a wide variety of structural, thermal, thermo-mechanically coupled and other multi-physics analyses.

MSC AFEA can be applied to solve a wide range of problems across a variety of industries including aerospace, automotive, biomedical, and electronics. MSC AFEA enables you to solve engineering models with complex behavior, including problems with multi-body contact, multi-step loading, nonlinear material, and geometric nonlinearity. Complex material models supported include metal plasticity, viscoelasticity, rubber elasticity, creep, composite behavior and more.

MSC AFEA enables users to create analytical geometry models or leverage existing investment in design tools by providing unparalleled integration with computer-aided design systems under one user environment. Manufacturing operations and processes, which are nonlinear, such as sheet metal forming, can be virtually simulated to predict actual results and reduce risk and cost. The adaptive re-meshing capability of MSC AFEA allows engineers to efficiently solve complex multi-body contact problems without having to review, re-mesh, and re-submit models for simulation saving time and expense.

Preprocessing using Patran

MSC AFEA allows access to all the powerful preprocessing capabilities of Patran including optional access to data from several CAD systems. Key Patran features include:

- Standard Geometry Access from
 - Parasolid
 - STEP 203 and 209
 - IGES
 - VDA
 - I-DEAS
- Parametric Modeling Capabilities
- Wireframe and Solid Geometry Creation and Modification
- 2D and 3D Finite Element Mesh Generation and Editing
- Advanced Surface Meshing
- Comprehensive Element Library
- Element Property Creation and Edit
- Material Property Creation and Edit
- Load and Boundary Creation and Edit
- Easy Contact Definitions
- Model Visualization and Verification

Capabilities

- Model Preprocessing
 - Comprehensive CAD integration allowing model import from all of the major CAD packages
 - Comprehensive meshing algorithms for automatic creation of quality meshes
 - Variety of methods for applying element properties, constraints, loads, and more
- Engineering Analysis
 - Advanced linear and nonlinear analysis capabilities to solve complex problems involving nonlinear materials, geometric behavior, contact and multi-physics
 - Easy multi-body contact definition without concern for contact pairing
 - Adaptive re-meshing to solve high deformation and plastic-flow problems
 - Multi-step load scenarios to simulate complex loading
 - Scalable domain decomposition to significantly reduce processing time through parallel processor capabilities
- Results Postprocessing
 - Advanced visualization techniques to gain complete insight of product performance.
- Open Architecture
 - Customization of the graphical user interface and analysis process

Benefits

- Reduce time required to develop high-quality models, increase productivity, and reduce risk with proven simulation tools
- Comprehensive CAD system data integration allowing model import from all of the major CAD packages
- Improve designs by understanding how they respond in operating environments.
- Gain access to the power of integrated computer-aided engineering at an affordable bundle price

Analysis Capabilities

MSC AFEA provides a full range of engineering analysis capabilities using the imbedded Marc solver including:

- Structural Analysis
 - Static Stress / Normal Modes
 - Linear Buckling / Post-Buckling
 - Transient Dynamics
 - Frequency Response
 - Harmonic Response
 - Creep and Relaxation
- Thermal Analysis
 - Steady State Heat Transfer
 - Transient Heat Transfer
- Coupled Thermo-Mechanical Analysis
 - Transient Dynamics
 - Creep
- Joule heating
- Electrostatics and Electrodynamics
- Automatic Remeshing
- Parallel Processing

Postprocessing using Patran

MSC AFEA provides a full range of capabilities for visualization and interpretation of analysis results available in Patran including:

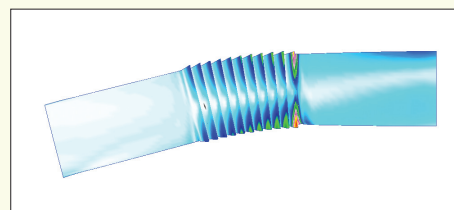
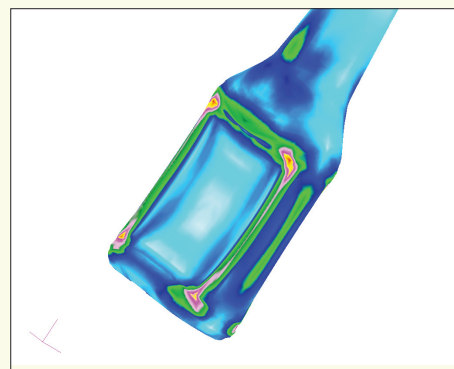
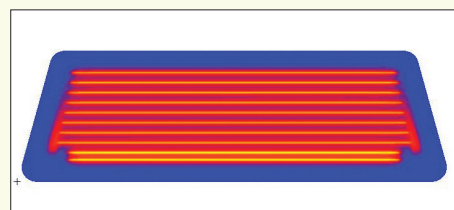
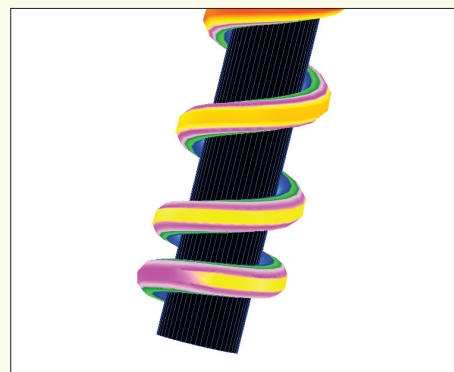
- Results Access
 - Marc POST File Import
 - Marc POST File Direct Results Access
- Results Visualization
 - Deformation / Contour
 - Vector / Tensor
 - Data History / Animation
 - Results Templates

MSC AFEA Package Options

- CAD Access
 - ACIS
 - Pro/ENGINEER
 - Unigraphics NX
 - CATDirect_V4
 - CATDirect_V5
- Productivity Tools
 - CAE Solid Modeling
 - Multi-processor capability
 - Laminate Modeler

Licensing Options

MSC AFEA is offered as a node-locked or networked license.



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