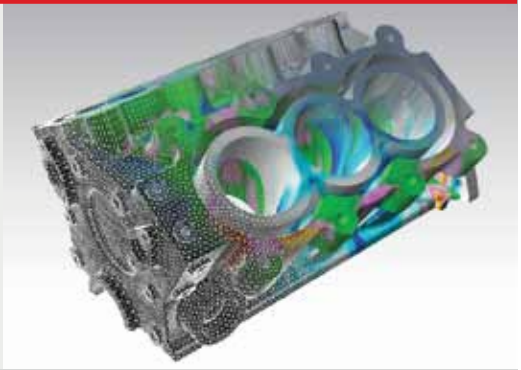
DATASHEET

Patran

The Industry's Leading Finite Element Modeling Environment



Overview

Patran is a comprehensive pre- and post-processing environment for FEA analysis and helps engineers to virtually conceptualize, develop and test product designs. Used by the world's leading manufacturing companies as their standard tool for the creation and analysis of simulation models, Patran links design, analysis, and results evaluation in a single environment.

For companies wanting to use FEA analysis to reduce the time and cost of the product develop¬ment process through increased use of simulation, Patran is an excellent solution for finite element modeling and results visualization and processing. By enabling engineers to access one of the industry's leading analysis programs from MSC.Software, Patran can help organizations reduce the cost and burden of maintaining multiple pre- and post-processing tools in different parts of the organization and get better products to market faster.

Through the seamless integration of CAD geometry, pre- and post-processing capabilities and the ability to perform sophisticated simulations on virtual parts, assemblies and structures, Patran is a key part of the design process for companies who rely on fast time to market and extraordinary product quality to drive market share and profits.

Patran enables engineers to directly import geometry from the CAD program of engineer's choice, and then define loads, boundary conditions, and material properties, perform different simulations under different conditions, visualize the results, and ultimately better understand the relationship between design decisions and product performance characteristics such as stress, strain, vibration, heat transfer and many more.

In addition, Patran's intuitive graphical interface is built to be fully customizable to your organization's unique engineering processes. With Patran Control Language (PCL), engineers can supplement the powerful modeling and analysis capabilities with their own, customized applications, commands, and menus. Patran users can easily and effectively iterate and evalu¬ate different design decisions and reuse existing designs and results without non-value-added manual clean-up and recreation of data.

Direct Access of CAD Geometry

Patran enables access to geometry from leading CAD systems for creating finite element models. Support for many industry-standard geometry exchange formats is also provided. An option is also available for direct import from and export into Parasolid format supported by several CAD systems. All finite elements, loads, boundary conditions, and material properties can be associated to the geometry.

Geometry Creation and Editing

Patran contains an advanced set of geometry creation tools in addition to the direct CAD access capabilities for generating finite element model geometry. Patran also has a sophisticated feature recognition capability that allows users to delete or edit holes, fillets, and chamfers. For 3D solid geometry, existing meshes and loads will be automatically re-applied to the model after a change is made to the geometry.

Integration with MSC Nastran and MD Nastran

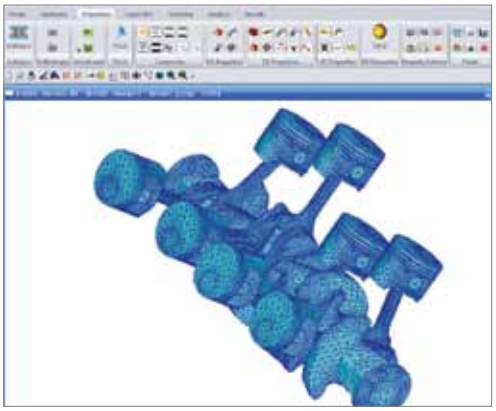
Patran is tailored to support both MSC Nastran and MD Nastran to enable the use of common finite element models and perform advanced engineering analysis and enhance designs using Nastran's Design Optimization and Topology Optimization capabilities.

Capabilities

- Intuitive graphical interface with direct access of CAD geometry with automatic/interactive feature recognition.
- Integration with MSC.Software's analysis solvers and third-party solvers
- Robust automatic surface and solid mesh generation with advanced surface mesh-on-mesh capability.
- Create connectors and bolts with pre-loads
- Full 3D general contact available for nonlinear analyses.
- Support for Nastran's Design Optimization and Topology Optimization.
- Support for Nastran's Superelements
- Support for Marc's Coupled Analyses
- Comprehensive results post-processing.
- Results standardization through results templates.
- Customization through Patran Command Language (PCL).

Benefits

- Increase productivity of your design and development process
- Reduce development costs through increased use of simulation technologies
- Improve productivity and accuracy with multidiscipline analysis and optimization



New Patran 2010 interface

MSC Software

Integration with MSC Nastran and MD Nastran

Patran is tailored to support both MSC Nastran and MD Nastran to enable the use of common finite element models and perform advanced engineering analysis and enhance designs using Nastran's Design Optimization and Topology Optimization capabilities.

Support for Multiple FEA Solvers

In addition to MSC Nastran and MD Nastran, Patran also supports the other solvers developed by MSC (Marc, Dytran, and MSC Sinda) and also solvers like Abaqus, Ansys, LS-Dyna and Pamcrash, enabling you to stay in a single graphical user environment even if you have to use multiple solvers for various analyses.

64-bit support for Performance

With the native port to 64-bit Windows and Linux,Patran can access all the available memory on the systems allowing the users to work with larger models, improving their productivity.

Graphical User Interface

Patran's graphical user interface is a forms-based, mouse-driven menu system for the operation of all tasks. It is designed to be easy to learn and use.

Interactive Help On-Line

Patran's "Help" system provides a "context-sensitive" hypertext mechanism enabling the user to quickly navigate through the entire on-line document to find information on topics of interest.

Finite Element Modeling

Patran's finite element modeling system permits the user to directly access model geometry and to quickly develop finite element meshes. Easily create and modify your finite element mesh using automated mesh generators and MSC.Software's technology such as the Mid-Plane and Advanced Surface Meshers.

Loads and Boundary Conditions

Patran provides a complete set of loads and boundary conditions such as structural and thermal. Functional variations can be evaluated with mathematical factors or other analysis results. Loads and boundary conditions can be specified as total or incremental basis.

Materials and Elements Properties

Patran supports an array of material models such as Isotropic, orthotropic, anisotropic, composite, thermal isotropic, thermal orthotropic and thermal anisotropic to perform a variety of analyses.

Results Evaluation

Patran can quickly and clearly display analysis results in structural, thermal, fatigue, fluid, magnetic terms, or in relation to any other application where the resultant values are associated with their respective finite elements or nodes.

Visualization

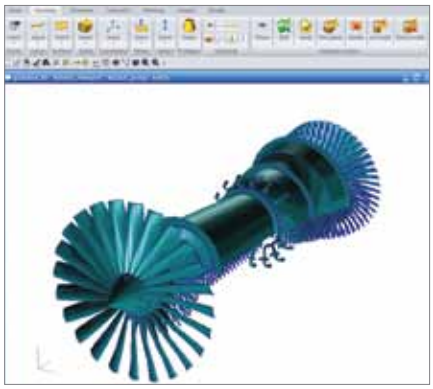
Imaging encompasses the complete graphics capability found within the Patran product, including graphic shading and visual verification prior to analysis. Imaging features a number of options that take advantage of specialized hardware capabilities, including local view manipulation, local shading, multiple light sources, and transparency.
You can also export images and movies in many standard formats to include in documents and web-based reporting.

Patran Command Language

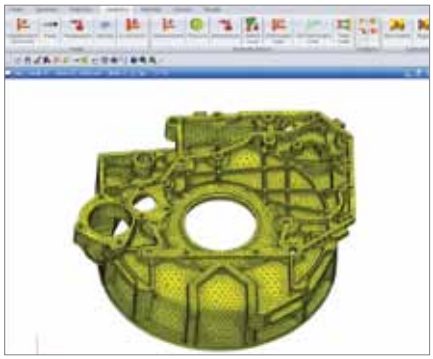
PCL is the programming language at the heart of Patran. PCL is a high-level, block-structured language that provides many features found in traditional programming languages. It can be used to write application or site-specific commands and menus, perform variational modeling, and to more completely integrate with commercial or in-house software programs.

Configuration Requirements

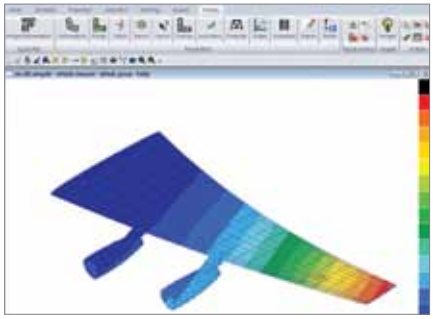
Patran currently supports many Unix, Windows and Linux based computer platforms, operating systems, and graphic devices. System resources required to operate Patran depend upon a number of factors including the overall size and complexity of each model. Please consult with your local MSC.Software representative for a current list of Patran supported computer systems for your particular application.



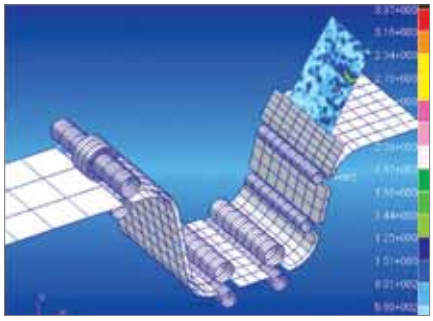
Geometry access from leading CAD systems



Quick modeling with advanced mesh technology



Integrated post-processing environment for analysis results



Integration with MD Nastran for multidiscipline simulations

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