

## Top 10 reasons for Patran customers to upgrade to Femap

[www.siemens.com/plm/femap](http://www.siemens.com/plm/femap)

white paper



- ▶ Developing exceptional products that meet strict quality and performance criteria cannot be left to chance. Femap® software from Siemens PLM Software provides a reliable, comprehensive and world-class digital simulation solution for your product development process.

# PLM Software

Answers for industry.

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## ► Top 10 reasons for Patran customers to upgrade to Femap

This paper presents the main technical and commercial reasons for investing in Femap, and upgrading from Patran to Femap, and clearly show why Femap is the leader for CAE products in many markets including aerospace, defense, heavy industry and shipbuilding.

More information on Femap can be found on: [www.siemens.com/plm/femap](http://www.siemens.com/plm/femap)

The following pages describe the top ten reasons that Patran customers should upgrade to Femap.



The advertisement features a purple background with three inset images of 3D models: a complex mechanical part at the top right, three robotic arms in the middle right, and a mechanical assembly with a stress analysis color scale at the bottom right. The word 'Femap' is written in white, with a diamond-shaped icon containing a lightbulb and the text 'ANALYZE FASTER' below it. The phrase 'Analyze faster' is written in a large, white, sans-serif font across the bottom half of the image.

**Femap**

ANALYZE FASTER

**Analyze faster**

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## ► Top 10 reasons for Patran customers to upgrade to Femap

### 1. Product quality and longevity

The Femap development team has remained constant for over twenty years and the future functionality development follows a well defined product plan. Consequently the Femap product releases regularly every few months and contains powerful new functionality that is guided by the user base.

Unique functionality added to Femap in the last couple of releases includes the following:

- Updated user interface to reflect the latest Windows look and feel
- Assembly model management which includes automatic assembly detection
- Linear contact
- Glued connection for connecting differently meshed components
- Results data mapping
- Weldment modeling
- Support for the fast sparse solver

With a solid development team committed to high quality product advancement through the provision of robust functionality, Femap is set to have a very strong future.

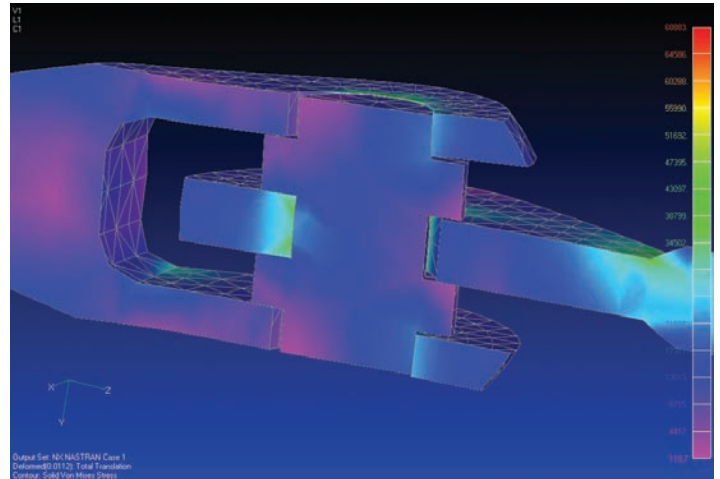
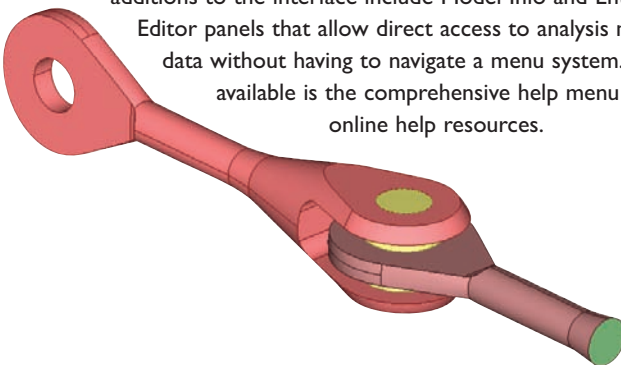
#### **Competitive advantages**

- High value for maintenance fees in terms of consistent and ongoing product functionality improvements
- Commitment to ongoing product development and enhancements
- Commitment to quality assurance
- Development team continuity

### 2. Ease of use and work process efficiency

Designed specifically for a native Windows environment, Femap offers comprehensive analysis functionality that is easy to use and quick to learn. Particular features that help to promote usability and efficiency include dynamic viewing, color and screen management, multiple model access, multiple undo steps and all within a user friendly and intuitive interface based on the latest Windows look and feel. More recent additions to the interface include Model Info and Entity

Editor panels that allow direct access to analysis modeling data without having to navigate a menu system. Also available is the comprehensive help menu and online help resources.



An efficient onscreen working environment brings about a reduced training overhead and allows engineers to maintain maximum productivity even when Femap is used on an occasional basis. The learning curve for Femap is also very short, and engineers can become productive in the use of the software after only two days training. Ease of use and deployment is a distinct advantage.

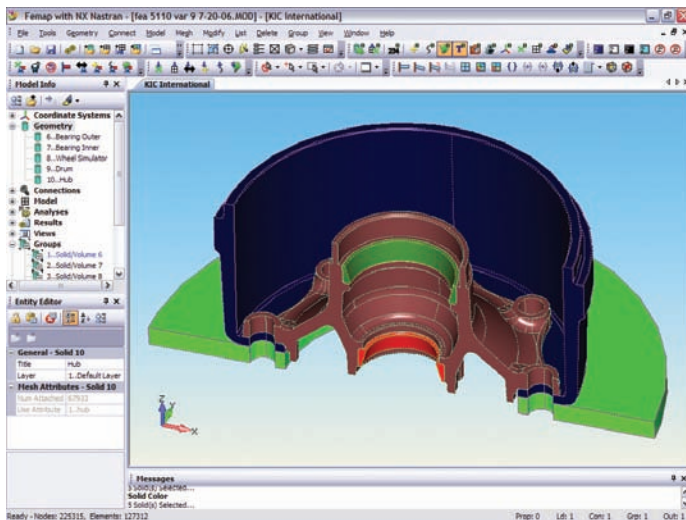
#### **Competitive advantages**

- User friendly, Windows native, command and menu system that includes the latest generation Windows style user interface features
- Fast learning curve that reduces the necessary time investment before productivity returns can be gained
- Typically a two-day training course is all that is required to instruct FEA-savvy (Patran) users to become proficient in using Femap
- The quick-to-learn user interface allows maximum productivity to be maintained, even with occasional use
- Strong functionality that promotes usability and efficiency
- Direct access to analysis modeling data that enables rapid creation and editing of models

### 3. Versatile modeling and visualization tools

Femap includes an impressive array of versatile modeling and visualization tools to aid FE model creation and verification prior to the analysis including easier-to-use dynamic viewing and color modification and management of view options and entities. Also available are unique model creation tools that allow 3D hex meshing, and multi- and mid-surface modeling and meshing. The depth of the model setup tools allows easier setup for material and property definitions, quick and easy load and boundary condition definition, and a flexible loading definition methodology for heat transfer and advanced dynamic analyses. Also unique to Femap are more advanced methods of defining loads that can be equation or function based.

More recent additions have extended Femap's modeling capabilities particularly for weldment modeling and assembly model management with automatic assembly detection that quickly and easily determines all contact areas which may then be set to be simply in contact or glued together.



### Competitive advantages

- Easier-to-use visualization management and viewing tools
- Unique 3D mesh creation tools
- Easier model setup for material and property definitions, and loads and boundary conditions
- Versatile loading definition for advanced analyses
- Advanced load definition methods that can be equation or function based
- Powerful new modeling functionality consistently added with every release

### 4. CAD access and geometry handling

Femap offers neutral CAD support that allows the analyst or engineer access to any kind of CAD data. Femap leverages the Parasolid® modeling kernel that allows direct access to Parasolid data for surface and solid modeling, and provides robust advanced geometric tools necessary to access non-Parasolid geometry. In addition, Femap is fully associative with Solid Edge® software.

With the exception of Catia V5 direct, all CAD interfaces are included in the base module of Femap, so it's possible to use a variety of CAD interfaces without incurring excessive cost.

Femap works well with imported geometry, and there are numerous tools available to clean up geometry and remove unwanted detail including automatic sliver elimination, solid stitching and manual and automatic feature suppression.

### Competitive advantages

- You can import CAD data from almost any source into Femap for analysis
- Femap offers a CAD-independent solution with most CAD accesses available in the base module
- Powerful geometry handling and cleanup tools
- Robust import editing and modification of complex 3D geometry

### 5. Extensive solver support

One of the strengths of the Femap program is its neutrality as far as analysis solvers is concerned. Femap offers access to all the main commercial analysis solvers with the ability to handle data peculiarities of the individual solver types easily and efficiently within its database architecture, and without having to manually change solver preferences. Full access to all supported solver types is available within the base Femap; no purchase of any add-on modules is necessary.

In addition, there are other types of advanced analysis options offered by Femap such as advanced heat transfer analysis solutions and 3D computational fluid dynamics.

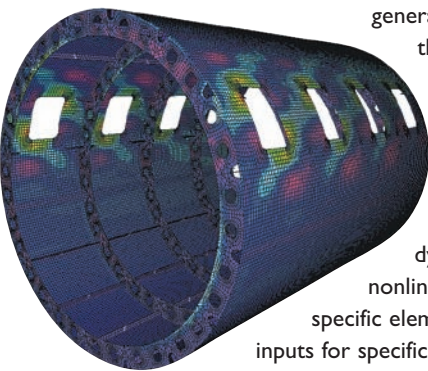
## ► Top 10 reasons for Patran customers to upgrade to Femap

### Competitive advantages

- Femap supports all major commercial solvers within the base module – no add-on modules are required to be purchased
- Femap's support for all solvers is ever present within the program and not preference based so there is no need to switch from one preference to another in order to support different solvers

### 6. Analysis functionality support

The high level of analysis functionality exposed by Femap and supported by the user interface provides great value to full-time analysts and occasional use engineers alike. This deep analysis functionality support in Femap is also couched in



general engineering terms rather than the more specific definition language of any specific solver.

Femap supports in-depth functionality in advanced analysis options such as dynamic response and highly nonlinear analysis, as well as

specific element formulations allowing inputs for specific solvers without having to change any preference. Femap also provides

superior beam modeling and visualization tools as well as support for a full element library including specific element formulations of a variety of solvers.

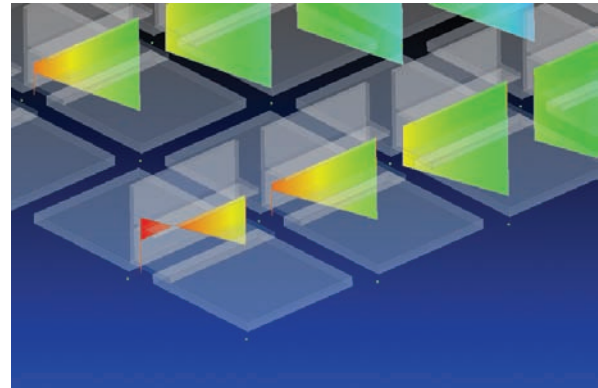
Femap also offers an interactive analysis monitor that can observe the progress of the analysis while it is running.

### Competitive advantages

- In-depth support for advanced functionality for all major commercial solvers
- Complete element library support
- Interactive analysis monitor

### 7. Post-processing versatility

Femap offers more complete results processing functionality, including in-depth easy-to-use contour plot options, and tools to enable quick and efficient understanding of the behavior of the system under analysis. Additional tools include time animations, streamlines, grid point force balance, free body diagrams with easy data selection for XY plots and easy setup of pass/fail criteria plots. Also available are powerful beam visualization and results display options including shear and bending moment diagrams.



ID	Topology	Color	Layer	C1	C2	C3	C4	1:Plate Top VonMises St...	1:Plate Bot VonMises St...
4	Quad4	2428	1	91	8	36	92	1499.724	1507.029
5	Quad4	2428	1	9	100	101	38	2397.222	2380.888
6	Quad4	2428	1	100	7	38	101	1304.878	1781.255
7	Quad4	2428	1	7	8	39	38	3185.22	2238.411
8	Quad4	2428	1	8	9	10	39	1420.91	2140.893
12	Quad4	2428	1	92	36	43	93	1358.461	2491.889
13	Quad4	2428	1	36	101	102	43	1584.226	2498.618
14	Quad4	2428	1	101	38	49	102	1209.509	2796.197
15	Quad4	2428	1	39	39	111	45	2058.291	2155.673
16	Quad4	2428	1	39	10	11	111	448.882	2489.601
21	Quad4	2428	1	44	111	112	42	1615.818	1143.884

Post solution Femap offers versatile results processing functionality using the Data Table for further data manipulation, sorting and results combination. Analysis sets, output sets and views can easily be exported to generate user defined reports.

### Competitive advantages

- Comprehensive tools to enable faster comprehension of results
- Data manipulation post analysis
- Versatile post solution results combination and manipulation functionality
- User defined report generation
- Beam visualization and results display options

### 8. Powerful customization tools

Femap offers an application programming interface (API). This is a full-featured Basic development environment which can be accessed directly from within the user interface. This OLE/COM object-oriented API, provides direct access to all Femap objects and functionality, and the Basic engine can interface with other OLE/COM compliant programs such as Word and Excel.

Femap's API is not proprietary and can be leveraged with an understanding of standard visual Basic programming knowledge and protocol.

Furthermore, Femap offers a facility to record, edit and play user-defined macros. This powerful capability allows external programs to interact with Femap, and can be used to record particular processes or workflows essentially extending functionality or to allow repetitive analysis tasks to be automated. Many prerecorded macros are delivered with the program and are available for general use.

**Competitive advantages**

- Extend Femap capabilities to add new applications, and interface with other external programs like Word and Excel
- API accessible through the UI
- Direct access to all Femap functionality
- Requires no special knowledge – program using standard visual Basic language or industry standard programming languages
- You can record, edit, debug and playback user-defined macros directly in the Femap interface

**9. Low total cost of ownership**

Femap solutions are offered at competitive prices, and the base module offers a lot of functionality which removes the need to purchase many add-on modules at extra cost.

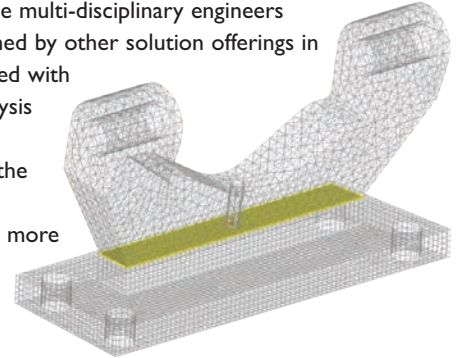
Savings can also be realized by implementing the software, as Femap has a fast learning curve that allows users to become more productive earlier. Also, the quick-to-learn interface means that occasional users can maintain high productivity. Overall the training overhead required to reach a reasonable level of proficiency for Femap is greatly reduced.

**Competitive advantages**

- Competitive pricing
- Better value for money – most functionality is included in the base module with only one single add-on module
- Easy and quick to learn, and easy to maintain proficiency for occasional users

**10. Scalability of solutions**

The high level of analysis functionality exposed by Femap and supported by the user interface provides great value to full-time analysts and occasional-use multi-disciplinary engineers alike and cannot be matched by other solution offerings in the industry. This, combined with the level of advanced analysis solutions offered by NX® Nastran software, makes the Femap with NX Nastran combination able to solve more complex engineering problems in a straightforward manner.

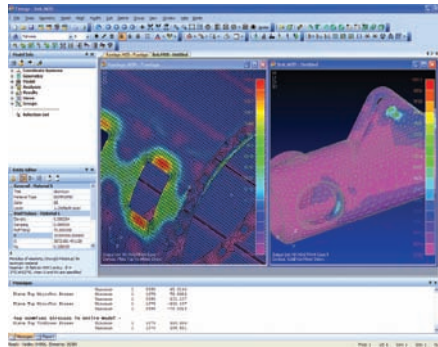


Within the base module of Femap with NX Nastran, there is support for some additional unique functionality like linear contact, glued connection and the fast iterative solver. The Femap and NX Nastran development groups work very closely together allowing new NX Nastran functionality to be supported very quickly in the Femap user interface.

Femap with NX Nastran offers a very flexible product configuration which is completely modular and can be tailored to your needs. Many of the more advanced solver options are available including Advanced Nonlinear, DMAP, Superelements and Aeroelasticity.

**Competitive advantages**

- Femap with NX Nastran offers a scalable solution up to the most advanced types of analysis within the same user interface
- There are no expensive niche applications built in to the base package
- Greater price flexibility with the Femap with NX Nastran configuration
- Powerful unique functionality is built into the base Femap with NX Nastran



For more details see [www.siemens.com/plm/femap](http://www.siemens.com/plm/femap).

### **About Siemens PLM Software**

Siemens PLM Software, a business unit of the Siemens Industry Automation Division, is a leading global provider of product lifecycle management (PLM) software and services with 4.6 million licensed seats and 51,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software's open enterprise solutions enable a world where organizations and their partners collaborate through Global Innovation Networks to deliver world-class products and services. For more information on Siemens PLM Software products and services, visit [www.siemens.com/plm](http://www.siemens.com/plm).

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