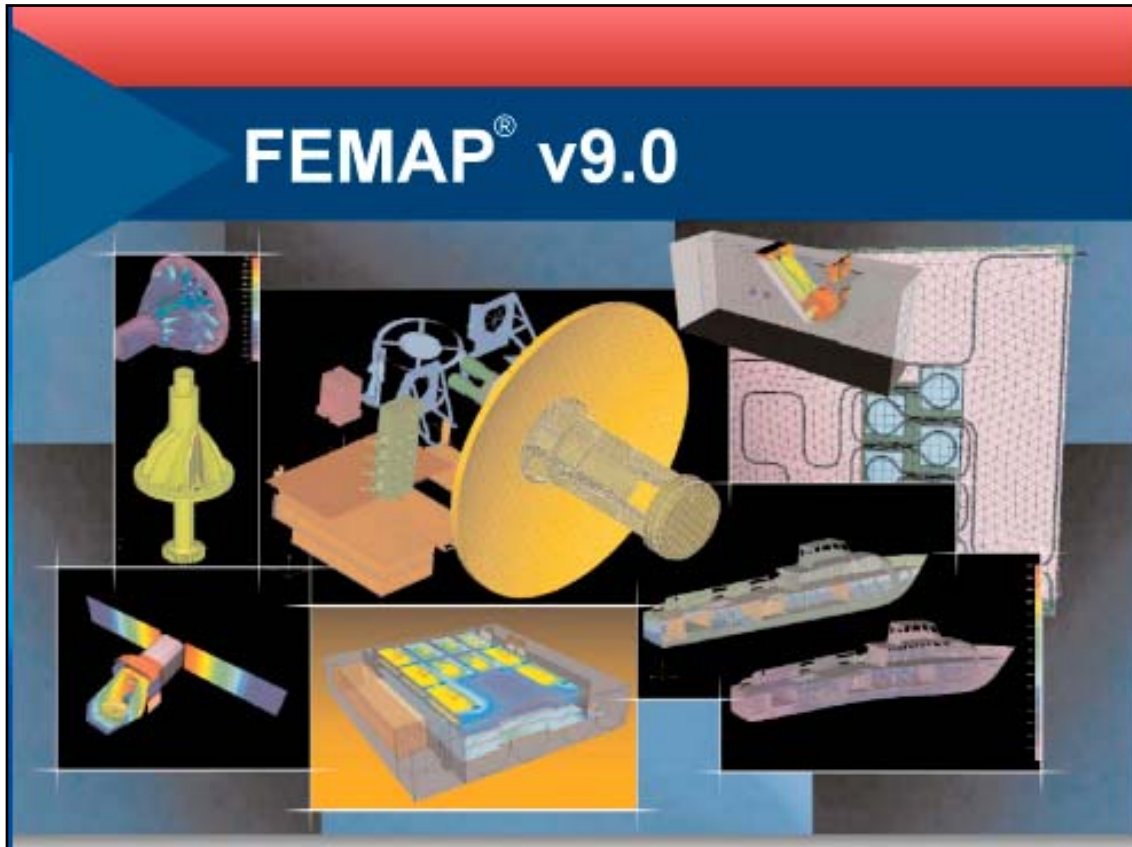


FEMAP[®] v9.0



FEMComp Engineering
Focusing On FEA

FEMAP[®] v9.0

Enhancements and new features

Welcome !

Tadeusz Chmielewski,

FEMComp Engineering
Focusing On FEA

Vaesteras, Sweden

FEMAP[®] v9.0

Enhancements and new features

- New User Interface
- Preferences, Graphics, OLE/API
- Geometry, Geometry Interfaces
- Meshing and Properties
- Analysis Program Interfaces
- Demonstration of **FEMAPv9.0** with NE/Nastran
- Discussion and Closing

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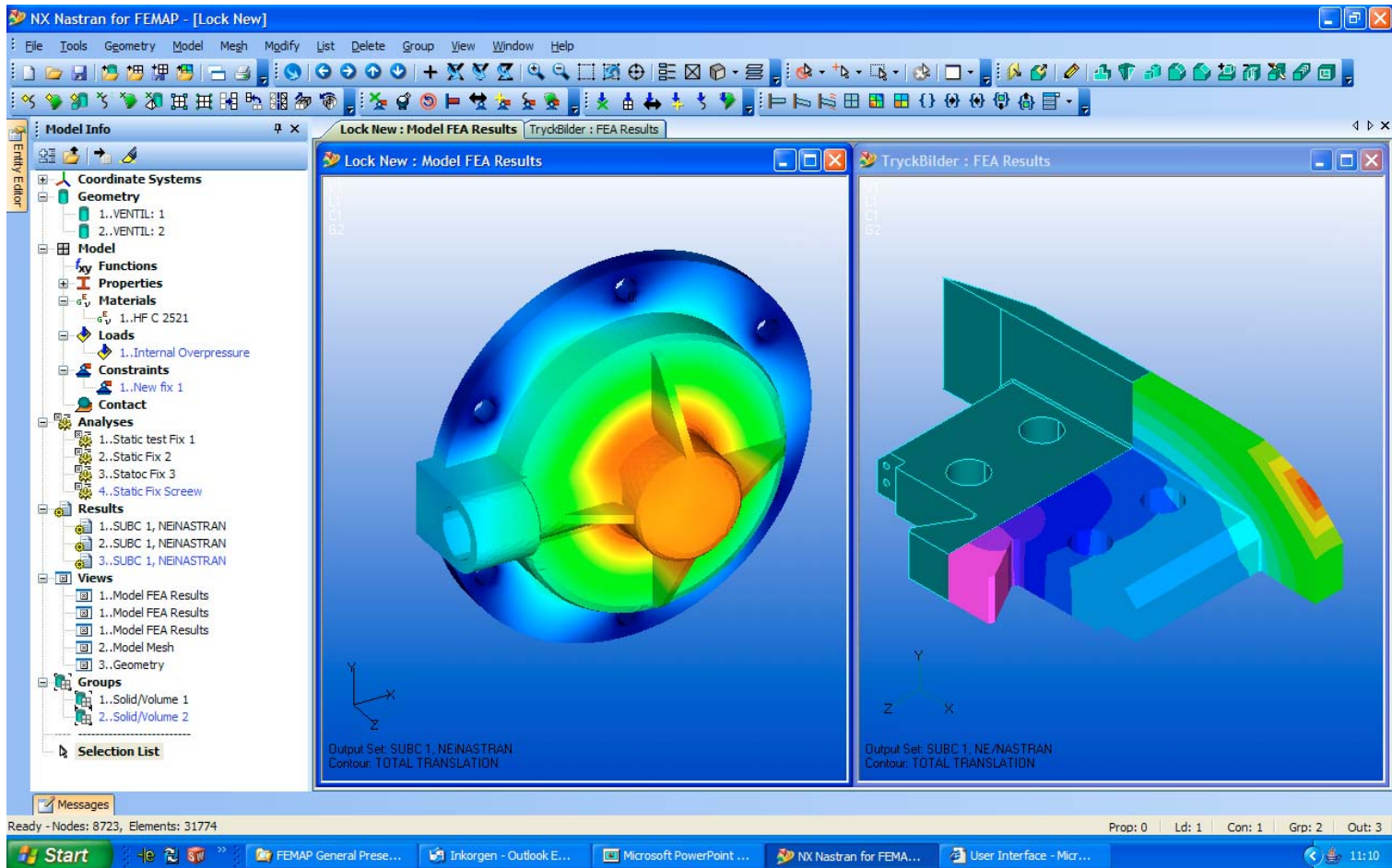
New User Interface (UI)

• Updated UI

- A **updated** user interface has been introduced for FEMAP v9.0
- Through the new UI, we will make it possible to more **quickly navigate** and **access** FEMAP commands and functionality and streamline the finite element modeling, analysis and post-processing process
- The user interface is now **MDI** compatible with Tile, Cascade, Pinning, Max/Min capabilities

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New User Interface



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New User Interface (UI)

• Menu

- **Icons** are shown in the menus adjacent to the **associated** command
- The menu can now be totally **customized**. This includes changing the text and icon, moving commands to new locations and adding and deleting commands

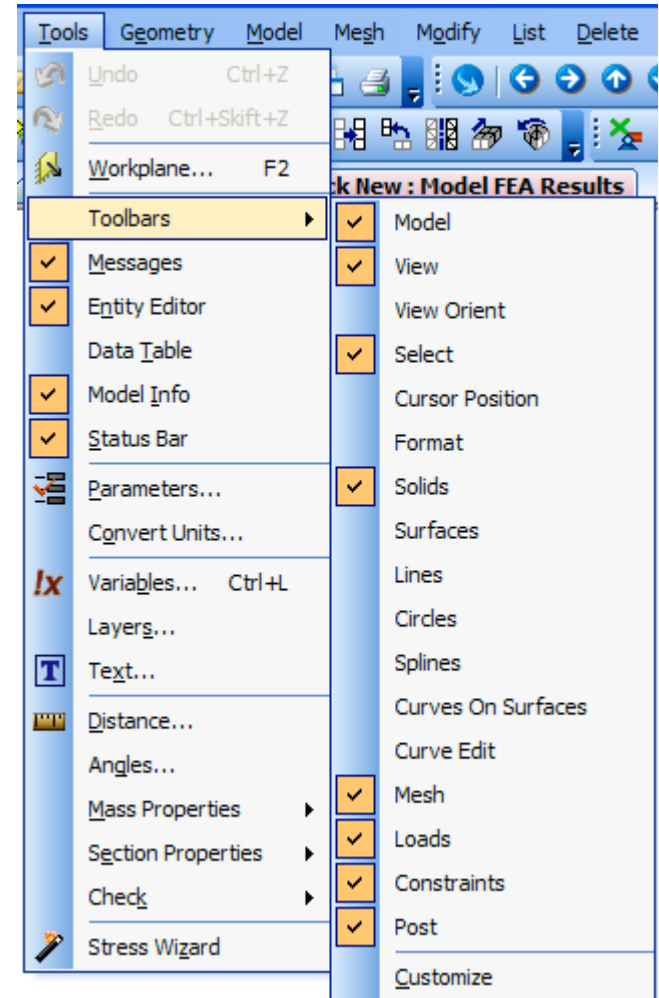
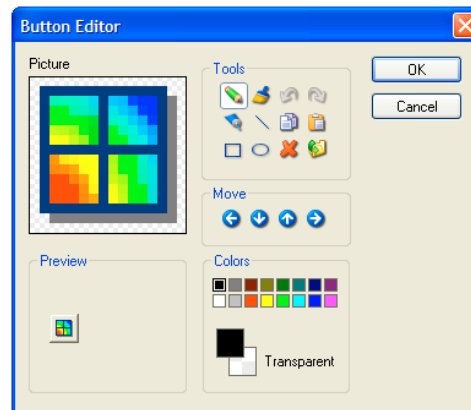
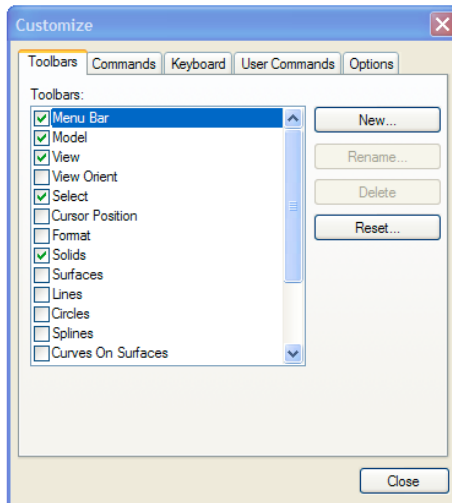


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New User Interface (UI)

• Toolbars

- **Dockable / Floating** toolbars
- Add standard FEMAP commands or user created commands to **new** toolbars
- **Customize** icons

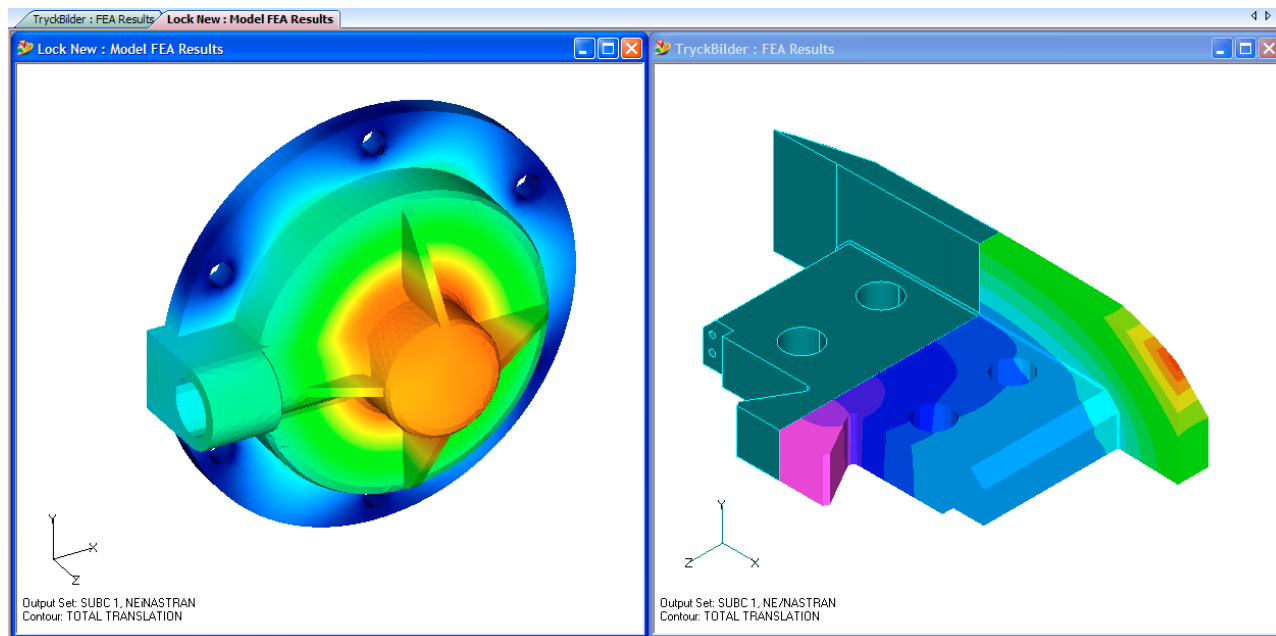


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New User Interface (UI)

• Graphics Window

- Display **multiple** views of a single model or multiple models.
- **Tabbed** interface to allow quick switching between multiple views, can be toggled on or off to increase desktop space

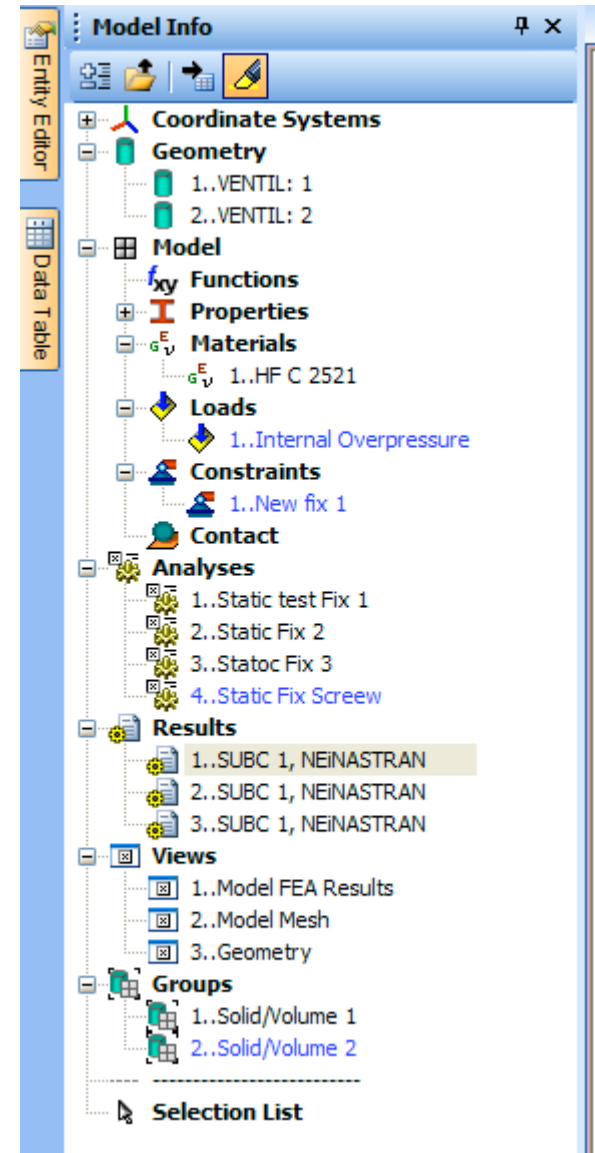
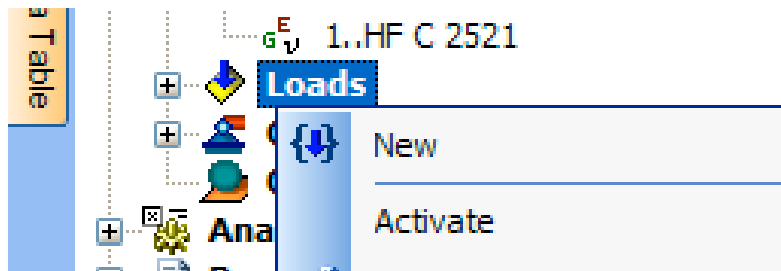


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New User Interface (UI)

• Model Info

- **Dockable** pane allows you to view and control a graphical "inventory" of many "top-level" entities in your model
- Displays the "Model Info" of the **active** model
- Common commands for individual entity types are available from the **right** mouse button on a Context Sensitive Menu

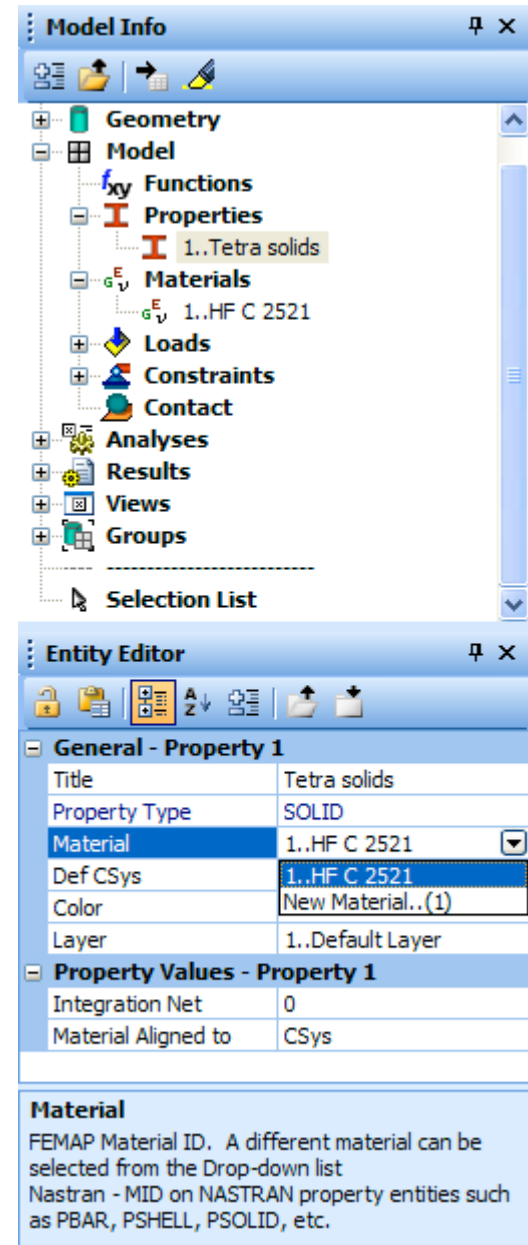


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New User Interface (UI)

• Model Info - Entity Editor

- Selecting an entry in the Model Info tree activates that entity for editing in the **Entity Editor**
- Entities that are selected in the tree can be **highlighted**

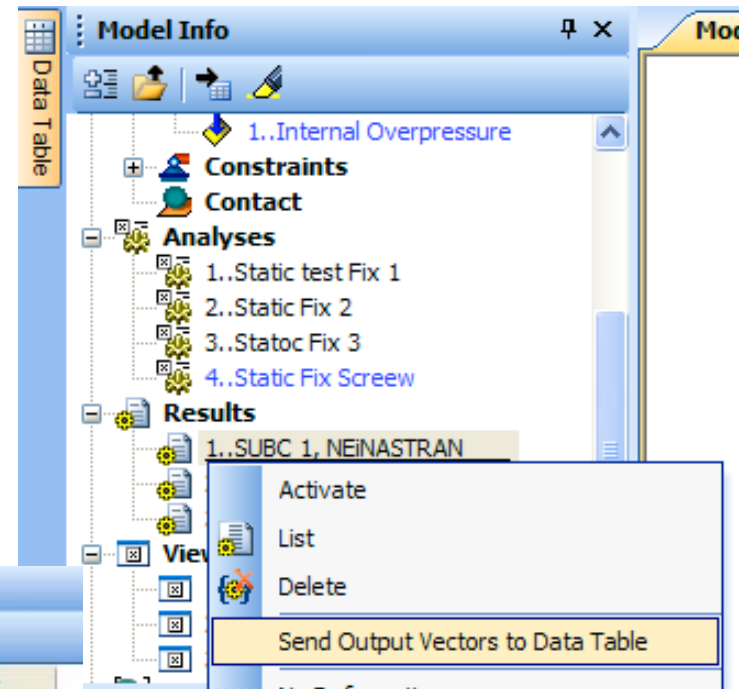


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New User Interface (UI)

• Model Info - Data Table

- Select entry in the tree and send the entity to the **Data Table**



Set ID	ID	Title	Min ID	Min Value	Max ID	Max Value
1	1	TOTAL TRANSLATION ...	376	0	102	0.000231407
1	2	T1 TRANSLATION	6625	-3.079387e-...	828	3.692537e-005
1	3	T2 TRANSLATION	1406	-4.095601e-...	1558	3.961811e-005
1	4	T3 TRANSLATION	3008	-6.372017e-...	101	0.0002308923
1	5	TOTAL ROTATION	1	0	1	0
1	6	R1 ROTATION	1	0	1	0
1	7	R2 ROTATION	1	0	1	0
1	8	R3 ROTATION	1	0	1	0
1	11	TOTAL VELOCITY	1	0	1	0
1	12	T1 VELOCITY	1	0	1	0

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New User Interface (UI)

• Model Info - Data Table

- Send entity data dynamically to the table using the **Selector**
- Each item is added to the next line in the data table with the data fields for that entity added as **multiple** columns
- String and data columns of table are **sortable**
- Output columns and element checks with lists of nodes and elements
- Mass properties and mesh information with geometric entities
- **Compare** output data from different output sets

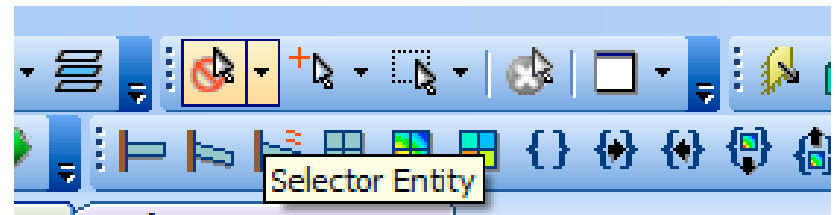
..	Element Topology	Color	Layer	Formulat...	Out-Element	Out-C1	Out-C2	Out-C3
	Tetra4	124	1	0	0	1.797897e-005	1.179865e-005	1.385533e-005
	Tetra4	124	1	0	0.000207041	0.0002038361	0.0002019542	0.0002015301
	Tetra4	124	1	0	0	0.0002292561	0.000228513	0.0002285875
	Tetra4	124	1	0	0	0.0002205098	0.0002222074	0.0002171641

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New User Interface (UI)

- **Selector Entity Menu**

- Selector **Entity**



- Selector **Mode**



- Selector **Actions**

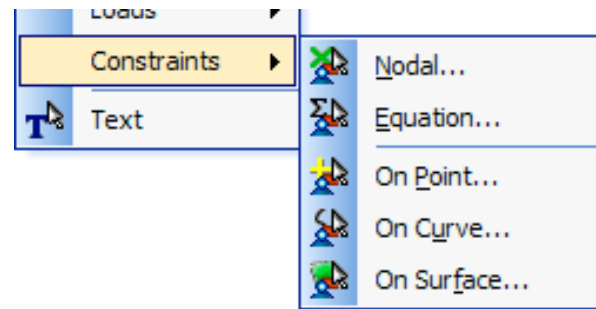
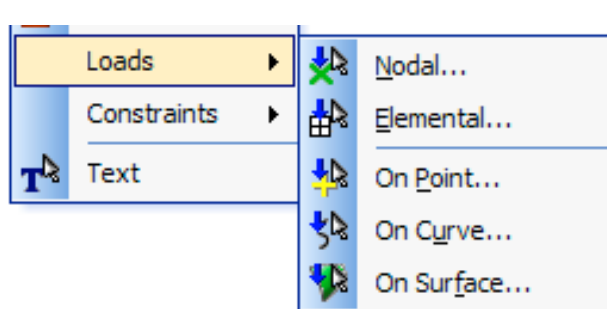
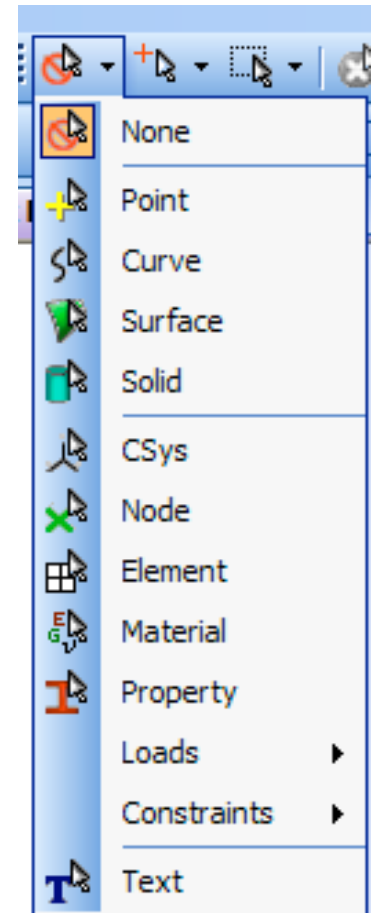


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New User Interface (UI)

• Selector **Entity**

- **type** of entity to select
- entity types are **separated** into geometric entities, finite element entities and text
- **Loads** and **Constraints** are selected by choosing the entity associated

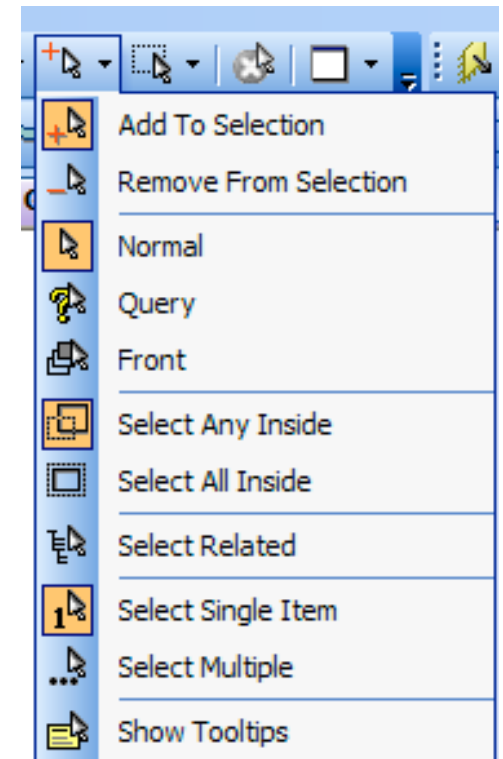
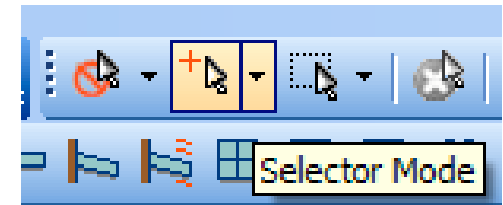


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New User Interface (UI)

• Selector **Mode**

- **Add** To Selection/**Remove** From Selection when Select **Multiple** is active
- **Normal, Query, Front**
- Select **Any** or **All** Inside
- Select **Related**
- Select **Single** Item, Select **Multiple**
- Show **Tooltips**

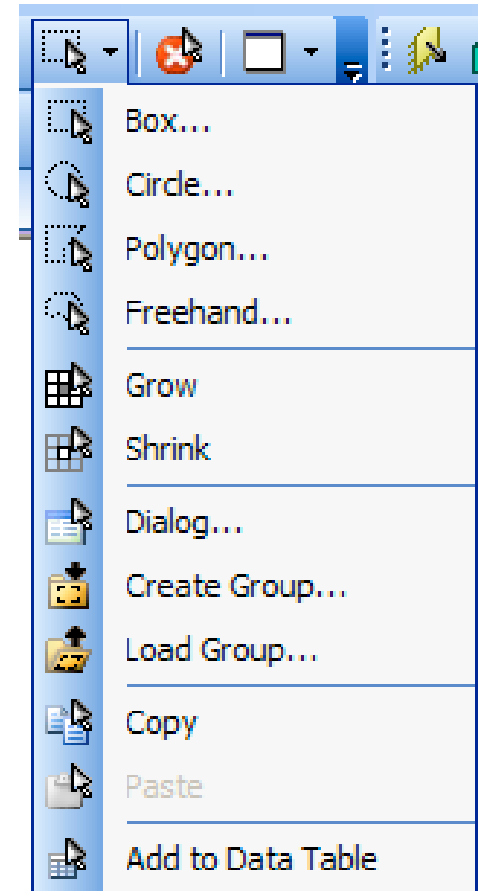


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New User Interface (UI)

- Selector **Actions**

- **Box, Circle, Polygon, Freehand** pick options
- **Grow** and **Shrink** commands
- Selection **Dialog** box,
- **Create** and **Load Group** commands
- **Copy** and **Paste**
- **Add** to the Data Table



FEMAP[®] v9.0

New User Interface (UI)

• **Message Windows**

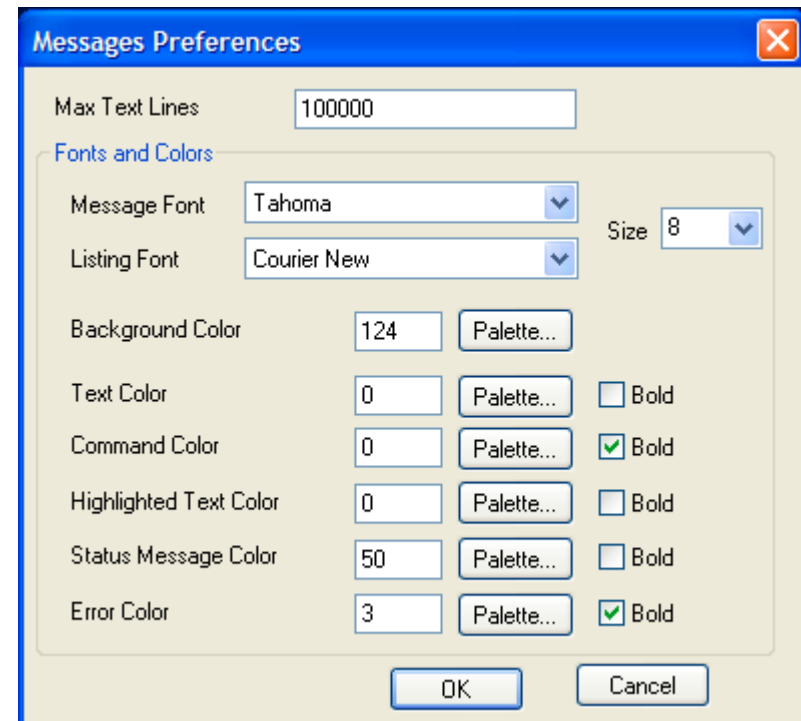
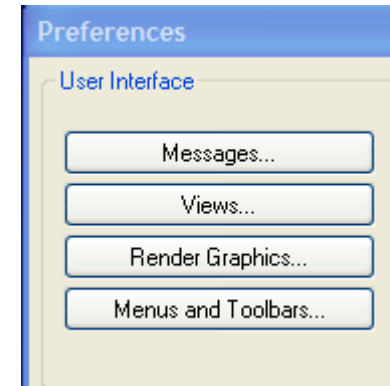
- Rich-text Format - **full control** of font (typeface, color, highlighting, bold, italic, bullet, centering...)
- Full **editing**, type in window, drag-and-drop text
- Full copy/paste - direct **interaction** with other Windows programs, including formatting
- **Include** graphics and other objects from Excel or other program

FEMAP® v9.0

Preferences, Graphics, OLE/API

• Preferences-Messages

- Deleted Borders and Size section
- Added field to set **Max** Text Lines
- Changed Font to Message Font
- Added **Listing Font** drop down list to set a specific font for listing operations
- Added Command **Color** to control the color of commands in the Messages Window
- Added **Bold** check boxes to all colors to allow font to be in Bold type

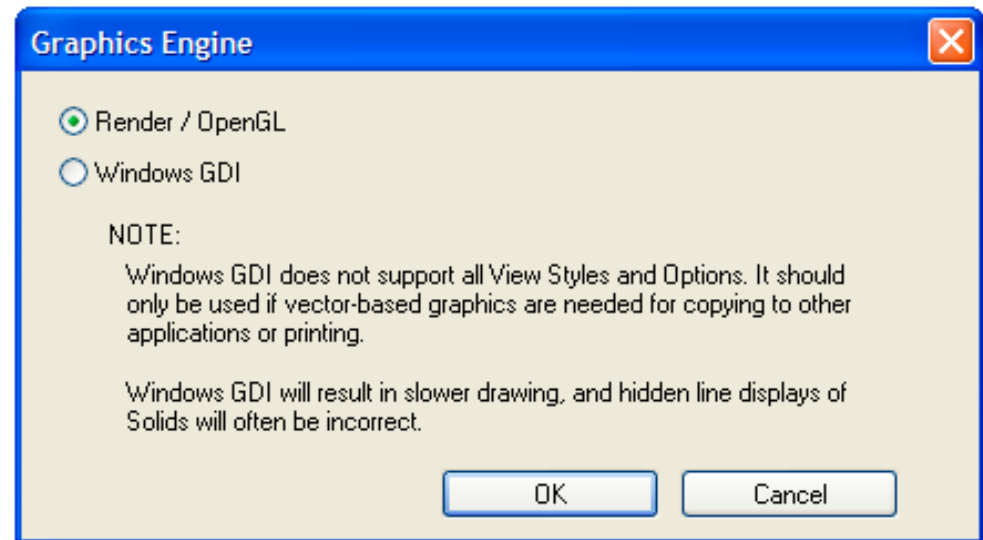
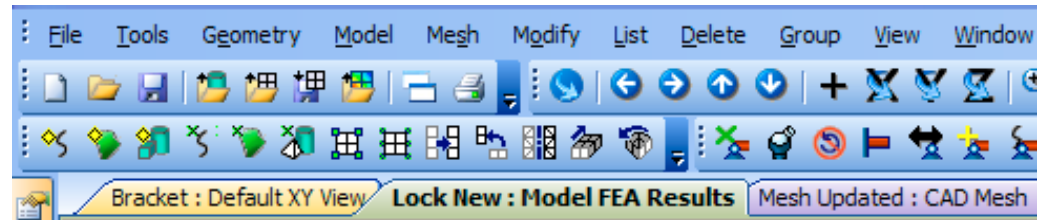


FEMAP® v9.0

Preferences, Graphics, OLE/API

• Graphics

- **Multiple** models can be opened in the same FEMAP interface
- **Line** Contours are available in Render Mode
- **Two** Graphics Engines in Render Options:
Render/Open GL and Windows GDI



FEMAP[®] v9.0

Preferences, Graphics, OLE/API

• OLE/API

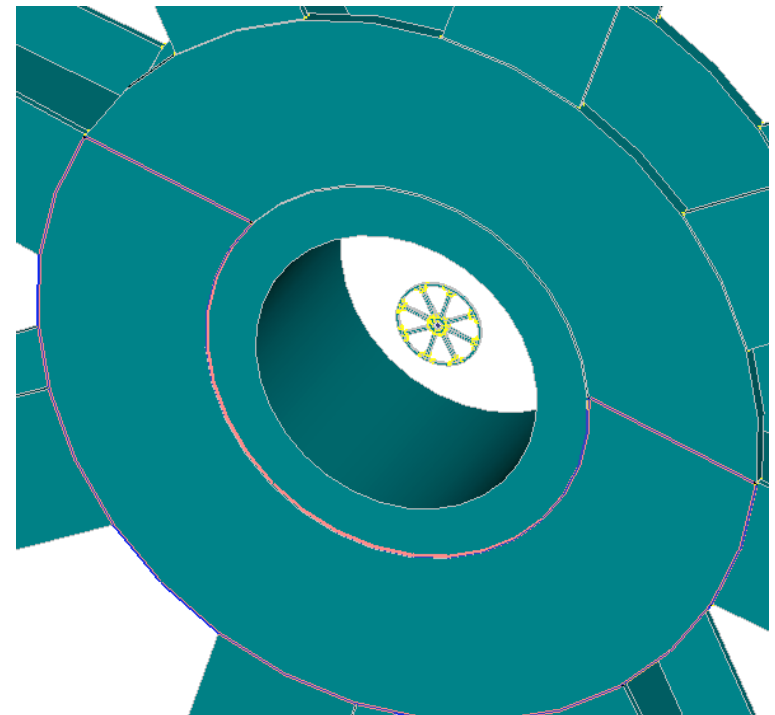
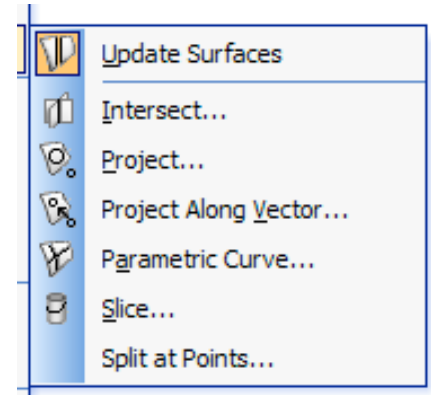
- FEMAP **API** is an OLE/COM-based **programming** interface to FEMAP
- It contains hundreds of functions that can be called from Visual Basic, VBA (Excel, Word, Access, ...), C, C++, or from the FEMAP Basic Scripting engine
- The OLE/COM based API that was introduced in FEMAP v8.1 has been further expanded for this release
- **New functions** have been added to the FEMAP Object

FEMAP® v9.0

Geometry, Geometry Interfaces

• Geometry new commands

- **Geometry, Curve - From Surface, Split at Points** requires you to choose a face to split and then choose points to split the selected face with a parametric curve
- If **Update Surfaces** is **on**, the affected surface will also be partitioned by this command

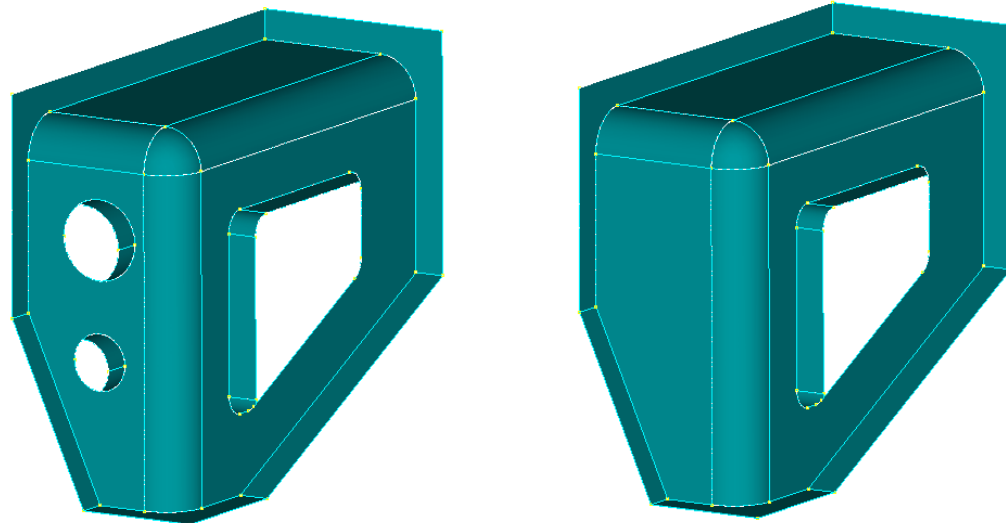
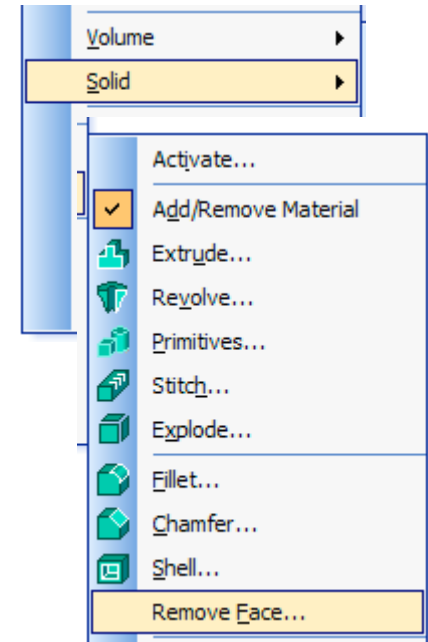


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Geometry, Geometry Interfaces

• Geometry new commands

- **Geometry, Solid, Remove Face** - allows you to "Remove a face" from a solid
- FEMAP will automatically "fill-in" or "remove" the portion of the solid that was represented by the chosen face



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Geometry, Geometry Interfaces

• **Geometry interfaces**

- The following interfaces have been updated to support newer geometry formats: **ACIS v13.0, Parasolid 16.1**
- Updated **Unigraphics** interface, supporting **v11 to v18**
- Updated optional interface to **CATIA v5 R9 and R10**
- The CATIA V5 interface permits direct geometry transfer from CATIA V5 to FEMAP
 - * It must be purchased **separately**
 - * The interface consists of **two** components: a plug-in that runs in CATIA V5 and generates a neutral file, and an integrated reader in FEMAP that can directly import the neutral file generated by the plug-in

FEMAP[®] v9.0

Meshing and Properties

• Mesh Sizing new option

- **Mesh, Mesh Control, Size On Solid** and option **Auto Boundary Small Surf** option
- This automatically **identifies** surfaces whose areas are under a user-defined **percentage** multiplied by the area of a "one mesh size" by "one mesh size" rectangular surface for a **given** mesh size. Once these "small surfaces" have been identified, they will be **combined** with neighboring surfaces to create a meshable boundary surface.

Automatic Mesh Sizing

Size For

Tet Meshing
 Hex Meshing

Basic Curve Sizing

Element Size

Replace Mesh Sizes on All Curves

Min Elements on Edge

Max Angle Tolerance Max Elem on Small Feature

Max Size of Small Feature

Vertex Aspect Ratio Length Based Sizing

Mapped Meshing Refinement

Suppress Short Edges %

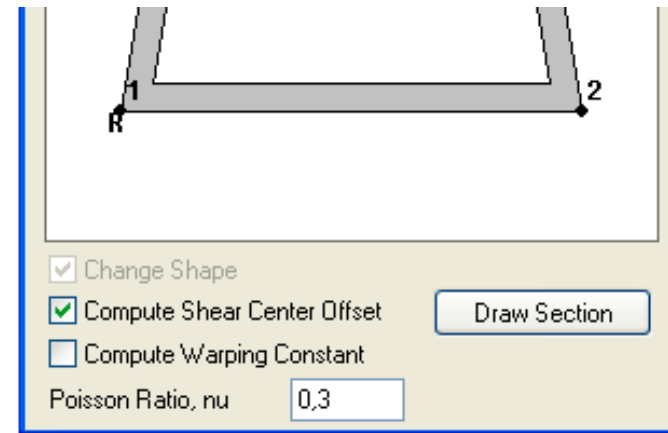
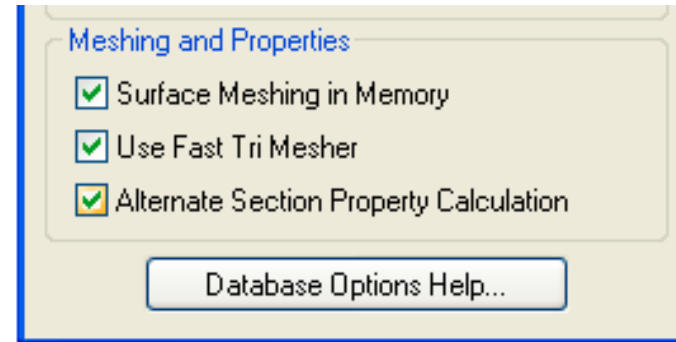
Auto Boundary Small Surf %

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Meshing and Properties

• Properties

- There is now an **alternate** section calculator for BEAM elements
- It is selected by File, **Preferences...**, **Database...** Alternate Section Property Calculation
- If the alternative method is selected, a **poisson's ratio** key-in is available on the Cross Section Definition dialog box



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Analysis Program Interfaces

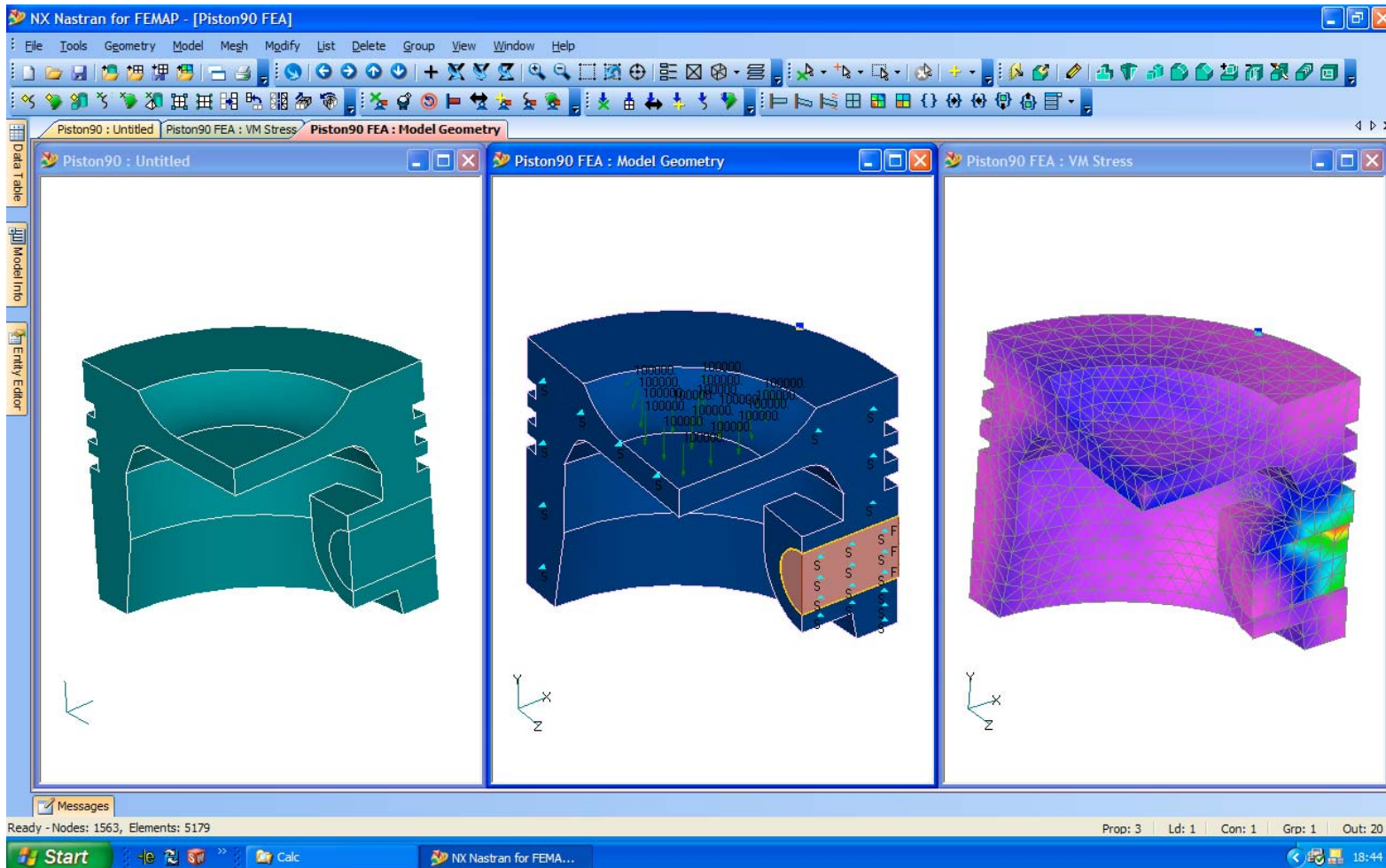
- Support for **New Versions** of Analysis Programs

FEMAP Interface	Latest Supported Version
–NX Nastran	NX Nastran 3.0
–ABAQUS	ABAQUS 6.4
–MSC.Marc	MSC.Marc 2005
–MSC.Nastran	MSC.Nastran 2005
–NE/Nastran	NEiNastran 8.4
–Ansys	Ansys 8.0

- Details, see "Analysis Program Interfaces" in the FEMAP User Guide

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Demonstration with NE/Nastran





Thank you for your attention!

