




Webinar:  
**Organizing Your Models with  
Femap Groups**


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March 18, 2022

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 [www.ata-e.com](http://www.ata-e.com)

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# ATA Provides High-Value Engineering Services With Expertise in Design, Analysis, and Test

ATA Engineering helps to overcome product design challenges across a range of industries



Aerospace



Robotics & Controls



Themed Entertainment



Defense



Industrial & Mining Equipment



Consumer Products



# ATA is a Value-Added Reseller for Siemens Digital Industries Software

ATA offers training, free resources, and hotline support for a variety of Siemens products.



- Siemens product lines we support include:
  - Simcenter STAR-CCM+
  - Simcenter Femap
  - Simcenter Nastran (formerly NX Nastran)
  - Simcenter 3D (formerly NX CAE)
  - NX CAD & CAM
  - Teamcenter
  - Solid Edge, Simcenter Amesim, HEEDS, and more
- Contact the hotline at 877-ATA-4CAE or <https://www.ata-e.com/software/technical-support-hotline/>
- Developer of the official Simcenter Nastran training materials
- Preferred North American provider of Simcenter Nastran training
- Recognized as Smart Expert Partner with validated expertise in Femap, STAR-CCM+, and Simcenter 3D

# Visit Our Website for Product Information and Free Resources

[www.ata-e.com/software/siemens-plm-software](http://www.ata-e.com/software/siemens-plm-software)

The screenshot shows the top navigation bar with the ATA logo and links for ABOUT, SERVICES, SOFTWARE, INDUSTRIES, PORTFOLIO, CAREERS, CONTACT, and a PROJECT INQUIRY button. The main content area is titled "Siemens Solution Partner" and includes a paragraph about ATA's role as a VAR for Siemens Digital Industries. Below this, there are three product cards: NX, Solid Edge, and Simcenter Femap, each with a small image and a "LEARN MORE" button.

**ATA ENGINEERING, INC.** ABOUT SERVICES **SOFTWARE** INDUSTRIES PORTFOLIO CAREERS CONTACT **PROJECT INQUIRY** Q

## Siemens Solution Partner

ATA is a value-added reseller (VAR) for Siemens Digital Industries Software CAE packages, specializing in CAD and CAE solutions such as NX, Femap, Simcenter 3D, Simcenter Nastran, and STAR-CCM+.

Unlike most VARs who simply resell standard software solutions, we use these products daily in our primary services role in order to solve challenging real world problems. This breadth of experience across a wide range of industries means we are solving the same issues as our software customers every day, allowing us to provide exemplary support.



### NX

NX is a next-generation digital product development system that helps companies transform the product lifecycle. [LEARN MORE](#)

### Solid Edge

Solid Edge is an industry-leading mechanical design system with best-in-class tools for creating and managing 3D digital prototypes at an affordable price point. [LEARN MORE](#)

### Simcenter Femap

Simcenter Femap provides engineers and analysts with a finite element analysis modeling solution to handle even the most complex tasks easily, accurately and affordably. [LEARN MORE](#)


The screenshot shows the top navigation bar with the ATA logo and links for ABOUT, SERVICES, SOFTWARE, INDUSTRIES, PORTFOLIO, CAREERS, CONTACT, and a PROJECT INQUIRY button. The main content area is titled "SOFTWARE SUPPORT HOTLINE" and includes a paragraph about the live hotline service. Below this, there are two columns: "Events and Training" and "Free Resources", each with a small image and a "VIEW" button.

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## SOFTWARE SUPPORT HOTLINE


Our live hotline provides comprehensive technical support for all of the Siemens software we sell, and it serves as the first line of support for our customer's questions and problems. This service is staffed by experienced engineers who use these tools every day, resulting in premier technical support for our software customers. The hotline was recently rated as "excellent" by our customers, and over 80% of issues were resolved the same day they were reported. When necessary, we can also help elevate issues to Siemens GTAC support.

Current ATA software customers may contact our hotline at [877-ATA-4CAE \(877-282-4223\)](tel:877-ATA-4CAE) from 5:00 AM to 5:00 PM Pacific or anytime through our [web interface](#).



### Events and Training

ATA has more than a decade of experience in the development of training materials for a variety of engineering software packages. ATA has a cooperative courseware development agreement with Siemens Digital Industries Software in support of its Simcenter Nastran software, one of the company's flagship computer-aided engineering products. [VIEW](#)



### Free Resources

Our software website also hosts a variety of free resources including whitepapers, training videos, and tutorials. These resources range from changing units in an NX model to the importance of superelements. They are specifically geared towards the topics our customers are interested in, and all content is free of charge. These resources are not available elsewhere and cannot be found anywhere else. We also host free live webinars covering different topics. All events are available on-demand. Resources are available on-demand. [VIEW](#)

The advertisement features a large image of a person in a white protective suit standing in a large industrial tunnel. The Siemens logo and tagline "Ingenuity for life" are at the top. Below the image, the text reads "Siemens PLM Software Femap" and "Powering today's most advanced engineering analysis environment". The URL "siemens.com/plm/femap" is at the bottom.

**SIEMENS**  
Ingenuity for life


Siemens PLM Software  
**Femap**  
Powering today's most advanced engineering analysis environment  
siemens.com/plm/femap




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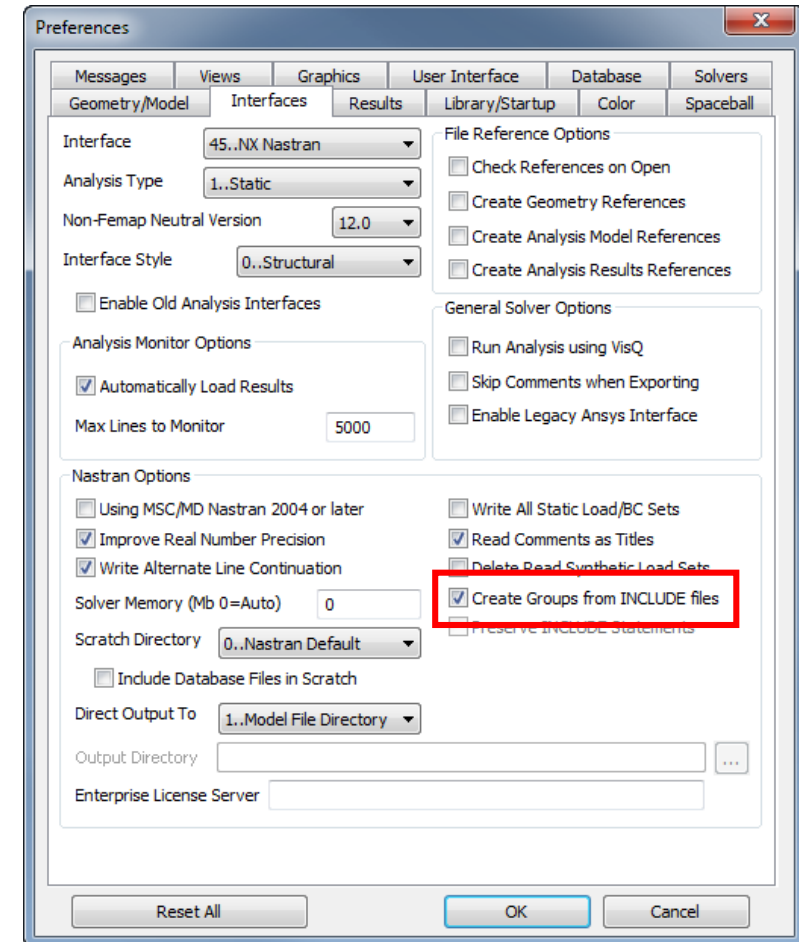
 [@ATAEngineering](https://twitter.com/ATAEngineering)

## Tips to Create Groups in Femap

- Femap is a great tool for making groups
  - View finite element models in pieces
  - Look for specific results
  - Documentation
- This presentation is a demo to highlight:
  - Grouping basics
  - Boolean operations
  - APIs for creating/editing/using groups
- This presentation will not cover: layers
- This demo assumes you have some basic knowledge of how to use Femap

# Femap Group Basics

- What can be in a group?
  - FEM entities (node, element, csys)
  - Glue/contact regions, properties
  - Loads, Constraints
  - Geometry
- When Importing a Model, Create Groups Based on INCLUDE files
  - Under File -> Preferences -> Interfaces
- Group by ID or rules
  - Nodes with ID 201-396
  - "All elements with property 100"
- An entity can be in more than one group
- Viewing
  - Active
  - Multiple (show/hide)



## Femap Groups Pair well with Nastran Debug

- Helps with debugging Nastran errors
  - Elements with geometry issues
  - Meshing errors: e.g. node attached to multiple RBE legs
- Add these elements/nodes to a group by ID to view

```
TOLERANCE LIMITS ARE: TET_AR = 100.00, TET_EPLR = 0.50, TET_EPIA = 30.00, TET_DETJ = 0.00, TET_DETG = 0.00
(xxxx = LIMIT VIOLATED)
```

ELEMENT TYPE	ID	LONGEST EDGE	SHORTEST HEIGHT	ASPECT RATIO	EDGE POINT LENGTH RATIO	EDGE POINT INCLUDED ANGLE	MIN. JACOBIAN DETERMINANT	MIN. DET(JAC) AT VERTEX
TETRA	1503764	0.04	0.02	2.12	0.72	42.33 xxxx	0.00	0.00
TETRA	1503820	0.05	0.02	2.30	0.98	44.53 xxxx	0.00	0.00
TETRA	1504005	0.03	0.02	1.60	0.62	48.28 xxxx	0.00	0.00
TETRA	1504547	0.04	0.01	4.14	1.00	30.01 xxxx	0.00	0.00
TETRA	1504687	0.04	0.01	4.78	1.00	30.01 xxxx	0.00	0.00
TETRA	1505009	0.06	0.02	2.88	0.97	35.04 xxxx	0.00	0.00
TETRA	1510992	0.04	0.02	2.19	0.48 xxxx	4.16	0.00	0.00
TETRA	1511899	0.04	0.02	2.14	0.36 xxxx	31.21 xxxx	0.00	0.00
TETRA	1511999	0.04	0.02	2.19	0.37 xxxx	24.77	0.00	0.00
TETRA	1512094	0.04	0.02	1.97	0.48 xxxx	3.00	0.00	0.00

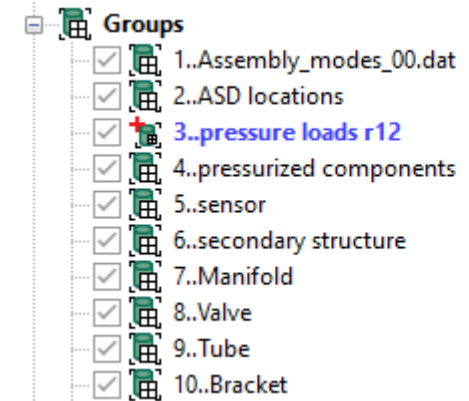
```
*** USER FATAL MESSAGE 5289 (WRGMTS)
DEPENDENT DEGREE-OF-FREEDOM GRID ID = 7000001 AND COMPONENT = 1 APPEARS ON MORE THAN ONE MPC OR RIGID ELEMENT ENTRY.
User information:
An MPC entry or rigid element entry lists the same dependent grid point more than once.
```



# Demo

## Group Basics

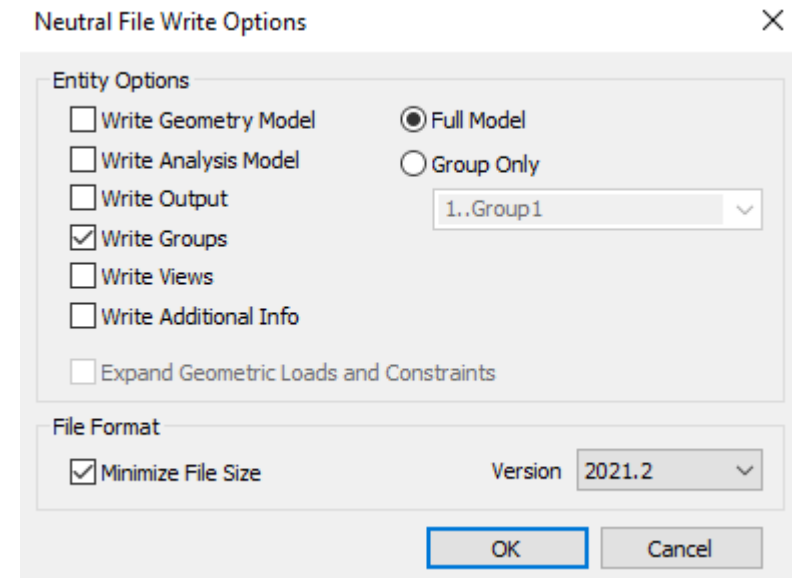
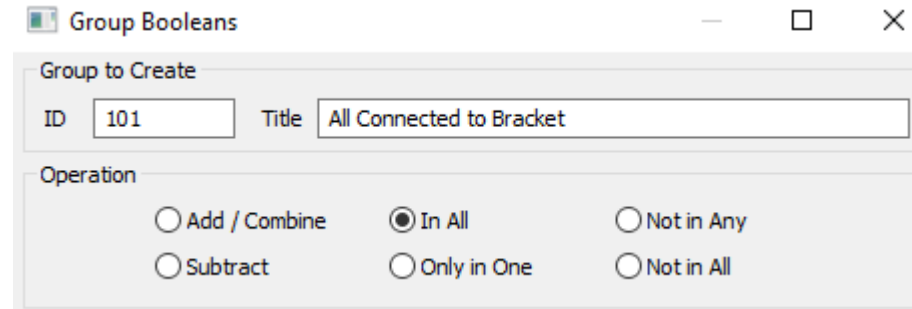
- Create a new group
- Rename a group
- Add items to the group
  - Several options to add things
  - Note that you can also pick by material, color, etc.
  - Use highlight tool to see what has been selected
- Copy or combine groups
- Displaying groups



# Demo

## Group, Advanced Use

- Automatic Add
  - To chosen group
  - To active group
- Evaluate
  - Satisfy group rules
- Booleans
  - Add
  - In All
  - Subtract
- List of all the elements in a group
  - Back and forth from Excel
- Neutral files:
  - Use them to save groups and use them for other models
  - File -> Export -> Femap Neutral, deselect everything except Groups
  - File -> Import -> Femap Neutral



# Demo

## Femap APIs

- Element Group Expand
  - Create group of RBE2s and/or RBE3s and their adjacent elements
- Find Node/Element Groups
- Exports groups to Nastran files
  - Removes unnecessary data so they can be used as INCLUDE files
- Writes element group(s) out to Nastran Set(s)
- Documentation
  - Takes node/element information of user-selected group(s) and prints it/them to Excel (min/max, #, mass, CG{x,y,z}, length, area, volume)

# Contact Us



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