

Simcenter Simulation: How to be a Simcenter Femap Expert

Extended Learning for Simulation Engineers

George Laird, PhD, PE – Principal Mechanical Engineer and Founder

APPLIED CAX

APPLIED CAX

AP·PLIED - /ə'PLĪD/- -ADJECTIVE

Put to practical use as opposed to being theoretical.
"applied chemistry"

C.A.X. - /SEE·AY·EX/ COMPUTER AIDED TECHNOLOGIES

The use of computer technology in the design,
analysis, and manufacture of products.

WE DO THIS EVERY DAY

Since 2008, Applied CAx has guided companies to realize their investment in digital engineering tools.

TEAMCENTER
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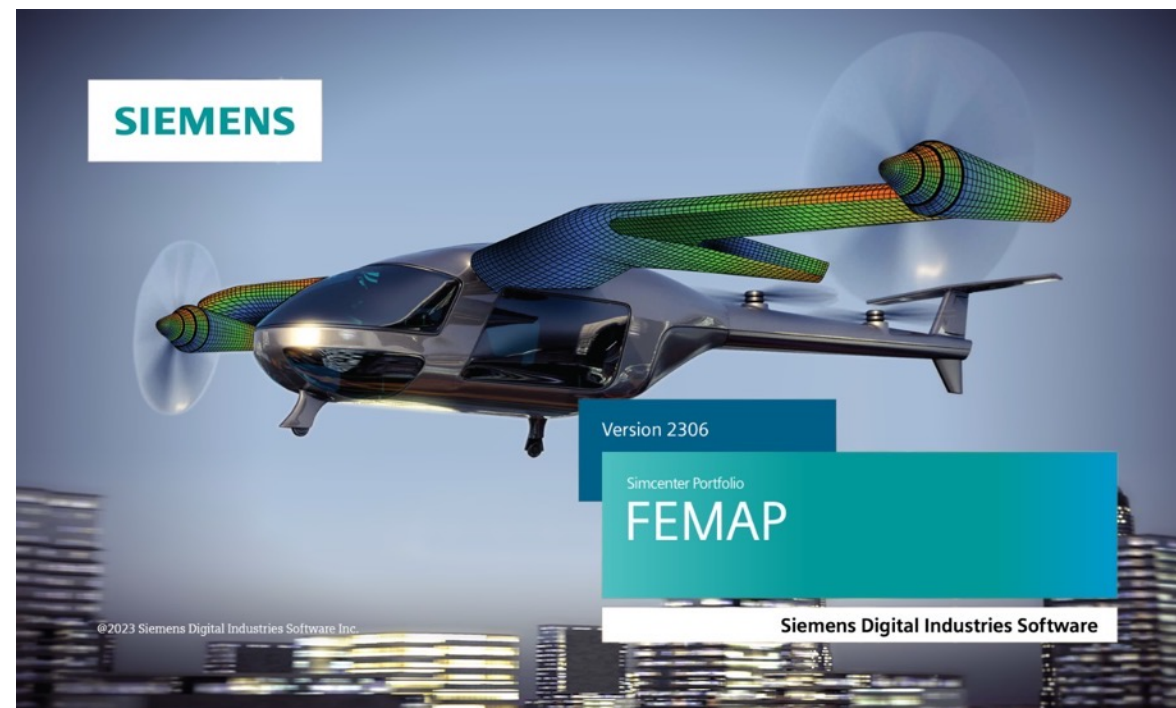
SIMCENTER 3D
FEMAP
STAR-CCM+
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FLOTHERM
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AMESIM

How to be a Simcenter Femap Expert

Building expertise in whatever skill set, be it carpentry, or learning to be an electrician or how to design a rocket, relies upon having a solid foundation to leverage or “knowing what you know” – which sounds trivial but often trips up the best of us. In this little seminar (30 minutes), we’ll cover the foundation of Simcenter Femap and show what makes it tick from a fundamental perspective, talk about how to leverage its tool set with some simulation examples, and talk about its development roadmap from today (v2306.1) and for its future.

Who Might Like to Attend?

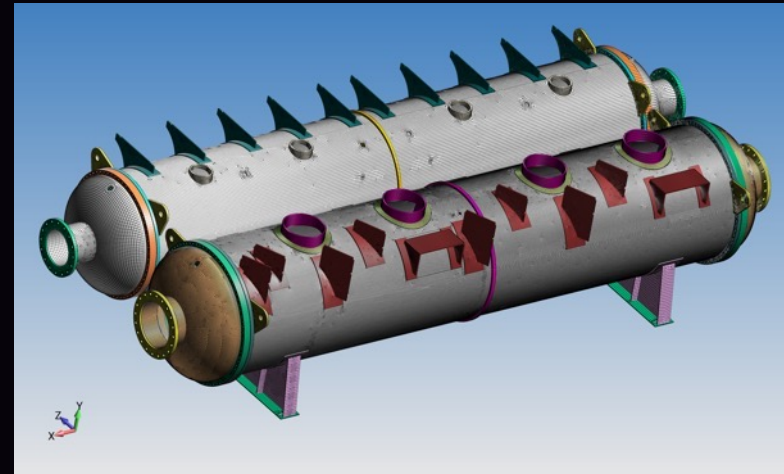
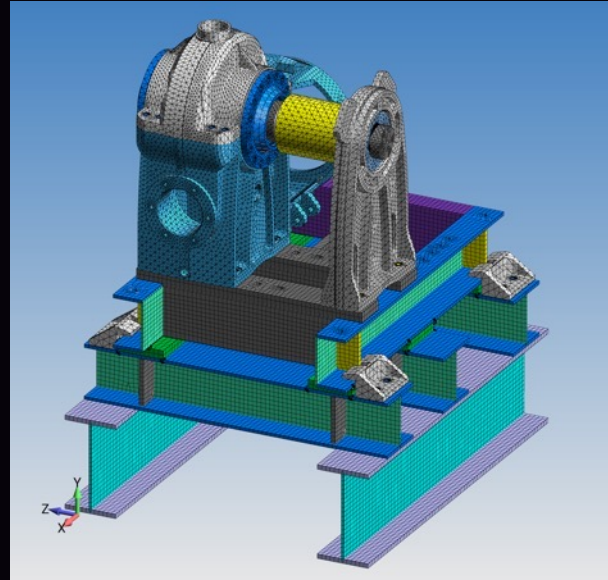
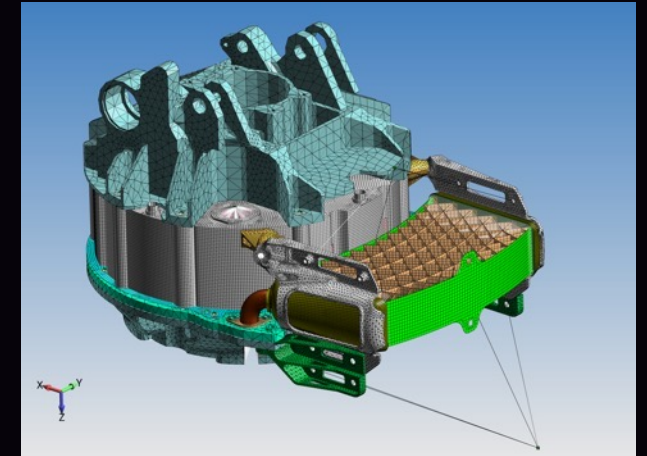
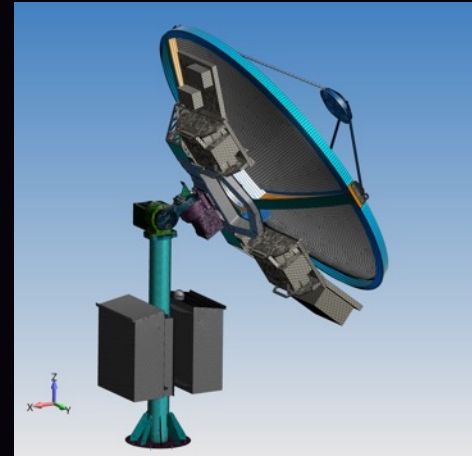
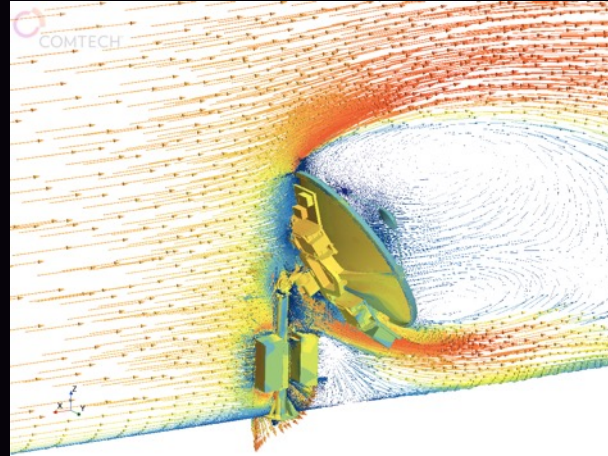
- New to Simcenter Femap and would like to learn about its foundation
- Inquisitive simulation engineer that would like to sharpen up their skill sets
- Experienced Femap users who would like to keep abreast of the ever-changing software landscape



How to be an Simcenter Femap Expert?

Simple:

- Do your homework
- Be Humble
- Read the Manual
- Attend Seminars
- Dedicated Effort
- Be Professional
- Be Proud



No limits simulation capabilities from CFD pressure mapping to multi-body analysis to advanced fatigue predictions. Simcenter Femap is no-holds barred FEA

How to Get Better? As easy as 1-2-3

1.) Enjoy the Technical Seminars

The screenshot shows the 'Simcenter Femap & Nastran Resources' page on the Applied CAx website. The page features a dark header with navigation links: CONTACT US, CAREERS, a search bar, PLM SERVICES, SOFTWARE, TRAINING, RESOURCES (highlighted), ABOUT, and TECH SUPPORT. Below the header, a breadcrumb trail reads 'You are here: Home / Resources / Simcenter Femap & Nastran Resources'. The main title is 'Simcenter Femap & Nastran Resources', followed by the subtitle 'FEMAP tutorials, videos, seminars, and resources'. The page displays four seminar cards, each with a thumbnail image, title, description, and a 'Read more ...' button. The seminars are: 1. 'Advanced Post Processing – How to Efficiently Share Your FEA Results' (created October 04, 2022), 2. 'Automation with the Femap API' (created August 03, 2022), 3. '998 Good Bricks - Simcenter Femap Hex Meshing Core Concepts and Efficient Workflows' (created May 23, 2022), and 4. 'Simcenter Femap v2022.1 – What's New and What's Good' (created February 08, 2022).

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Simcenter Femap & Nastran Resources

FEMAP tutorials, videos, seminars, and resources




Advanced Post Processing – How to Efficiently Share Your FEA Results

Library of Simcenter Femap Online Seminars Created: October 04, 2022

In this on-demand technical seminar, we take the grand tour of the PostProcessing Toolbox. Any experienced Simcenter Femap user will know their way around the Toolbox, but it is a worthwhile talking point because it's always changing and improving.

[Read more ...](#)




Automation with the Femap API

Library of Simcenter Femap Online Seminars Created: August 03, 2022

Introducing the world of automation accessible through FEMAP's Application Programming Interface (API).

[Read more ...](#)




998 Good Bricks - Simcenter Femap Hex Meshing Core Concepts and Efficient Workflows

Library of Simcenter Femap Online Seminars Created: May 23, 2022

If you're an experienced finite element analyst, you know that hex meshing is golden but creating a well-structured brick is a skilled craft. If you're new to the game, you're probably asking "why suffer for a hex mesh?" and then "How do I develop these skills?". In this online seminar, we are going to cover theory, fundamentals, and the newest techniques to make it faster.

[Read more ...](#)



Simcenter Femap v2022.1 – What's New and What's Good

Library of Simcenter Femap Online Seminars Created: February 08, 2022

The New Year is here and along with it comes a new release of Simcenter Femap – v2022.1. You might have already seen the official releases from Siemens or the ubiquitous 'new features' webinars on YouTube, but we want to present something a bit different. Since we've had this software in our hands for a while (one of the benefits of beta-testing), we would like to share the features that we find the most useful as practicing engineers.

[Read more ...](#)




















How to Get Better?

As easy as 1-2-3




























1.) Enjoy the Technical Seminars

2.) Read the Manual

Femap PDF's

-  api.pdf
-  Commands.pdf
-  Custom Tools.pdf
-  Digital ProdExp and Prod Excellence Program Admin Guide.pdf
-  Examples.pdf
-  Femap Online Subscription.pdf
-  Installation and Configuration Guide.pdf
-  Library Management.pdf
-  License Borrowing.pdf
-  Nastran Help.pdf
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-  Neutral.pdf
-  othertrans.pdf
-  readme.pdf
-  readprev.pdf
-  User Guide.pdf
-  VisQ.pdf
-  Whats New Previous Verions.pdf
-  Whats New.pdf

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How to Get Better?

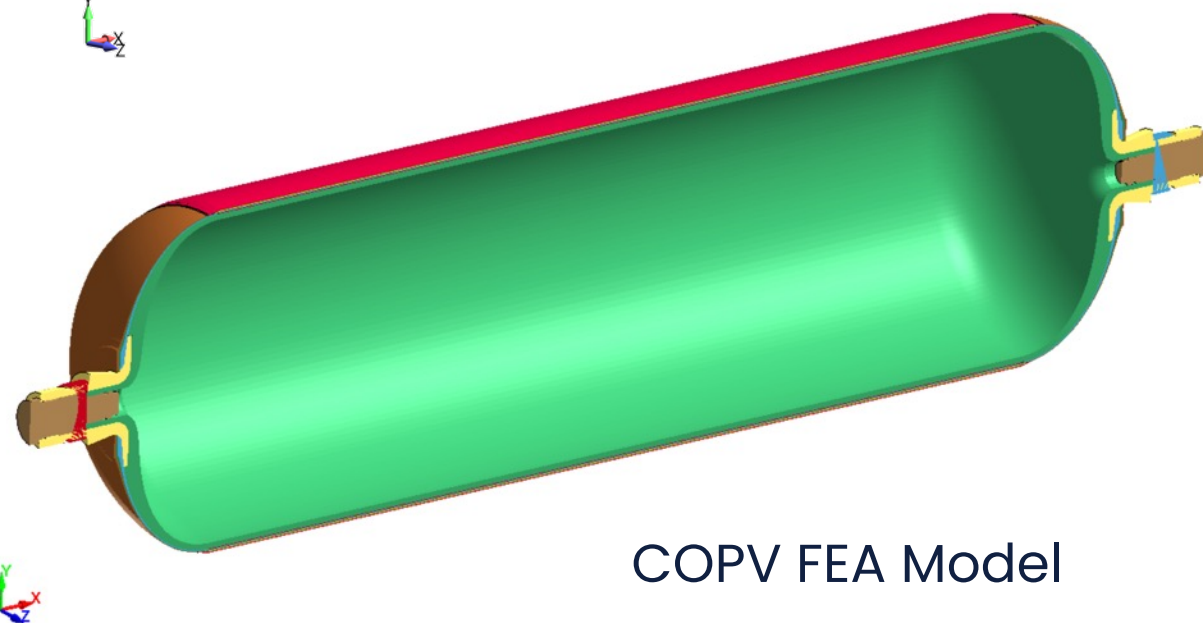
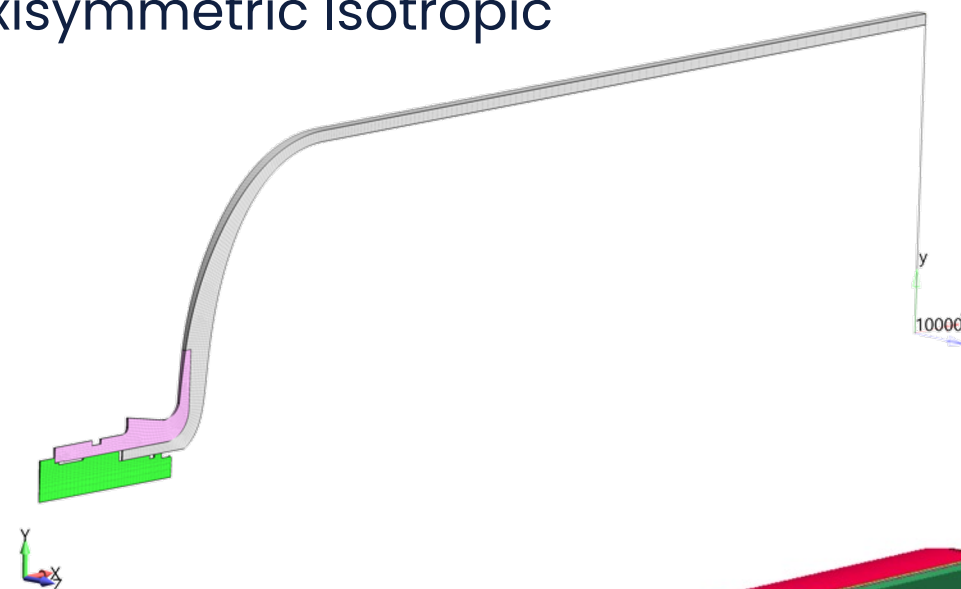
As easy as 1-2-3

1.) Enjoy the Technical Seminars

2.) Read the Manual

3.) Build Pilot Models

Axisymmetric Isotropic



Tricks of the Trade

The Things that we Enjoy with Simcenter Femap

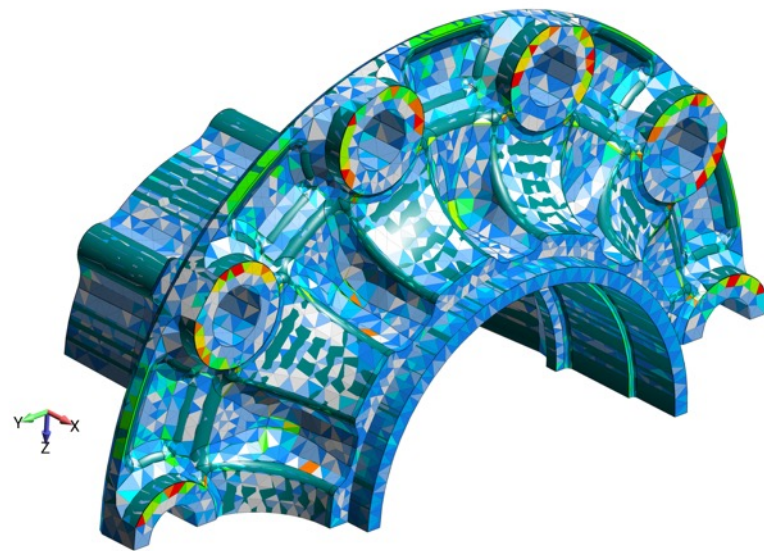
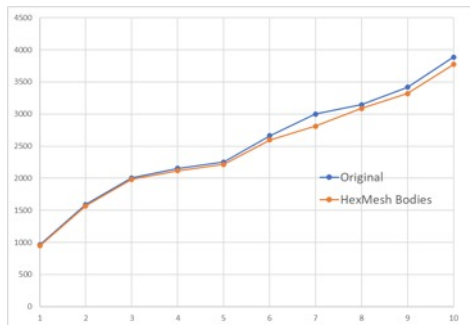
Ultimate Mesh Control
(Get what you Want Where you Want)

A.) Solid Meshing

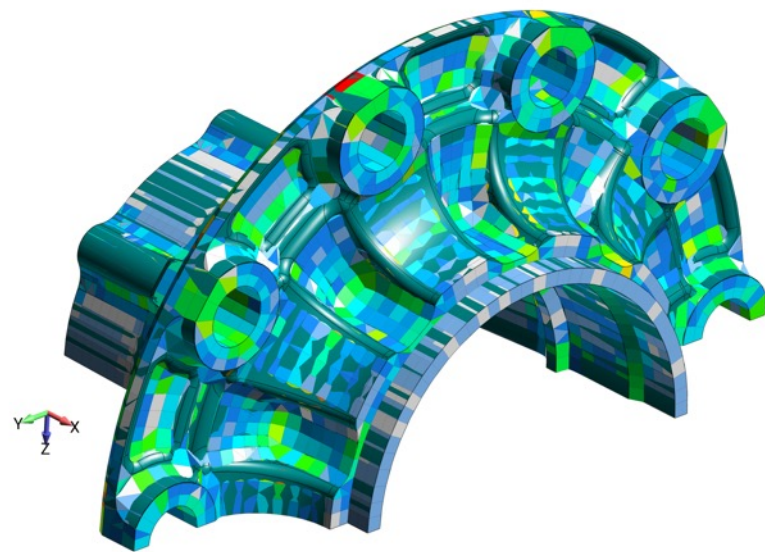
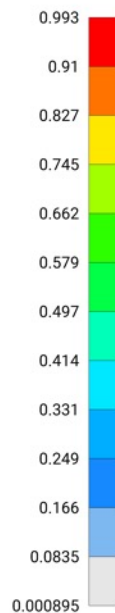
Mesh – 102k Nodes

HexMesh Bodies – 27k Nodes

So What?



Output Set: Model Data to Contour
Elemental Contour: Jacobian



Output Set: Model Data to Contour
Elemental Contour: Jacobian



Tricks of the Trade

The Things that we Enjoy with Simcenter Femap

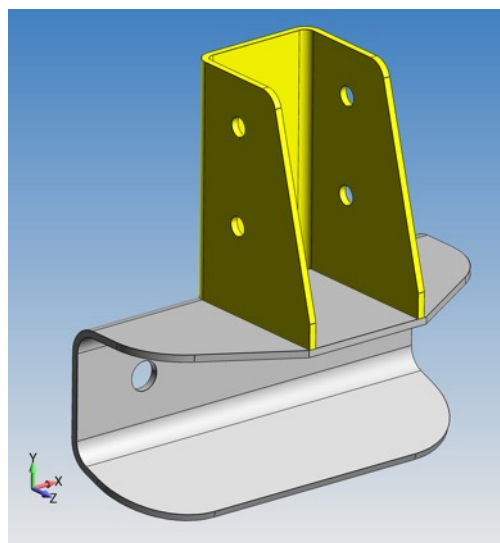
Ultimate Mesh Control

(Get what you Want Where you Want)

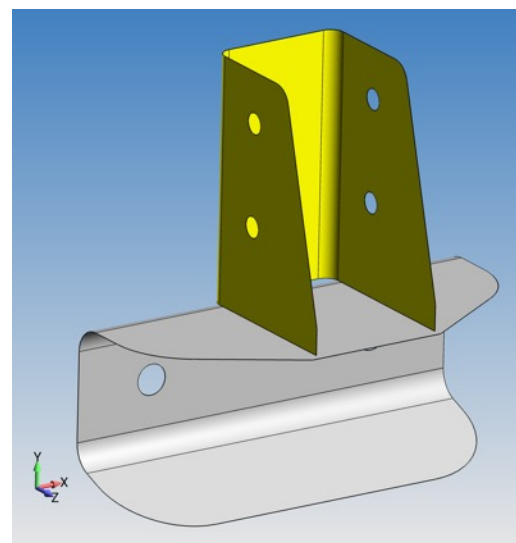
A.) Solid Meshing

B.) Surface Meshing

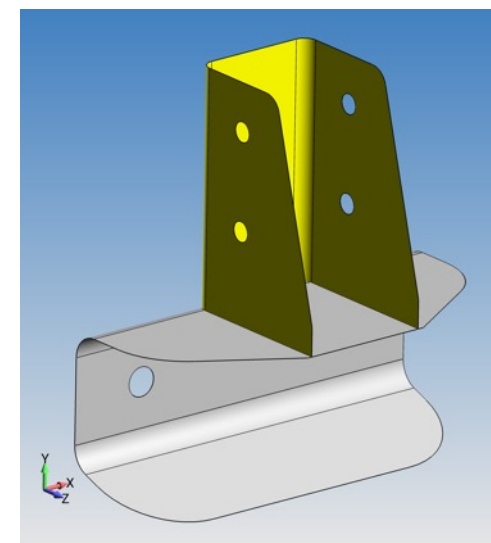
3D Geometry



Midsurface



NonManifold Add



Tricks of the Trade

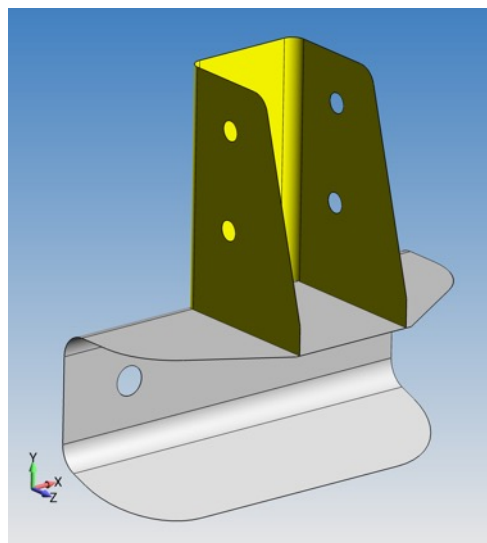
The Things that we Enjoy with Simcenter Femap

Ultimate Mesh Control

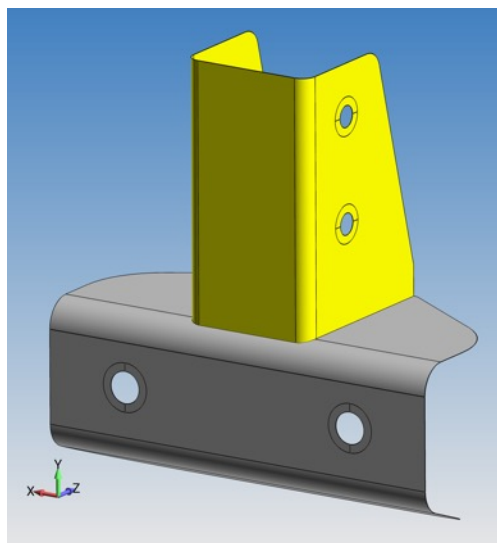
(Get what you Want Where you Want)

- A.) Solid Meshing
- B.) Surface Meshing
- C.) Meshing Toolbox

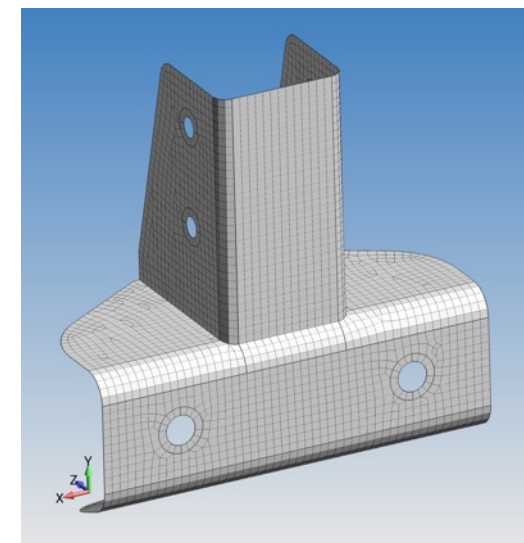
NonManifold Add



Washer – 0.1



Mesh and Clean



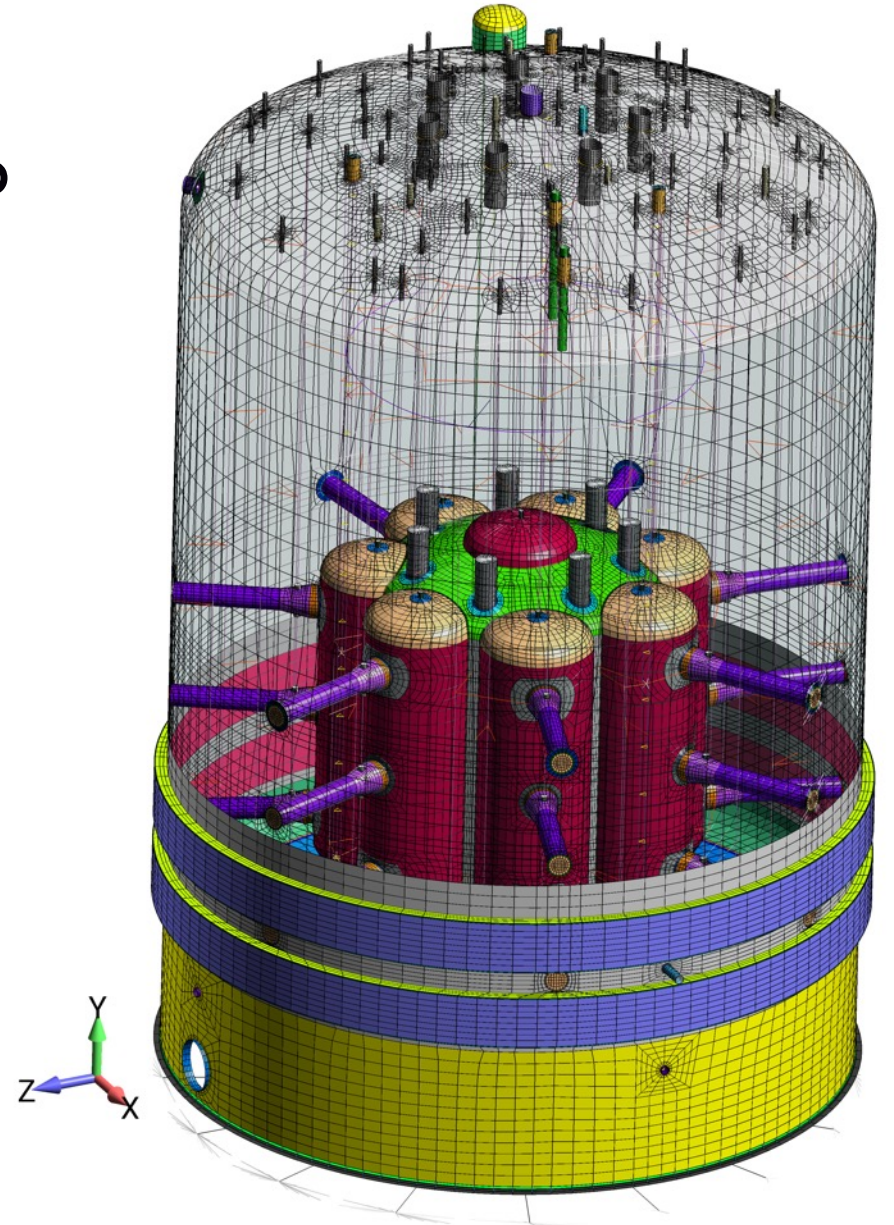
Tricks of the Trade

The Things that we Enjoy with Simcenter Femap

Ultimate Mesh Control

(Get what you Want Where you Want)

- A.) Solid Meshing
- B.) Surface Meshing
- C.) Meshing Toolbox
- D.) Selector



Tricks of the Trade

The Things that we Enjoy with Simcenter Femap

Ultimate Mesh Control

(Get want you Want Where you Want)

- A.) Solid Meshing
- B.) Surface Meshing
- C.) Meshing Toolbox
- D.) Selector
- E.) API



FEMAP Application Programming Interface
Automation and Customization



Roll over image to zoom in

Learn the FEMAP API (Application Programming Interface) for Automation and Customization - Video training series - Updated December 2022 Spiral-bound – January 1, 2022

by Adrian Jensen (Author)

[See all formats and editions](#)

Our video-led tutorial workshops (Updated December 2022) for learning the Simcenter Femap Application Programming Interface (API) will have you improving your FEA workflows and saving your valuable time & labor. It uses a blend of theory and practice that allows students to automate modeling processes, modify the model, import/export data and more. Learn from our expertise! With your purchase you receive complete digital download information:

[Digital Book]

Access to our web-based video tutorials, with step-by-step instructions and over 500+ minutes of narrated tutorials!

Workshop projects and model files, with starting CAD geometry or Femap models

Your user account will provide access to a wealth of training resources developed by our skilled trainer. The author has over 8 years experience teaching Simcenter Femap & Simcenter NX Nastran, receiving excellent

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Femap API Guide

Femap2306

HTTP 23067 Fluid Mass Balance Calculation			
1	Complete Operating Liquid Weight	3,500,000 lbs	
2	Specific Gravity of Fluid	5.5	
3	Upper Vessel Shell Property Number	302012	0.000100576
4	Lower Vessel Shell Property Number	302012	0.000100576
5	Bottom Head Under Jacket Property Number	301712	0
6	Bottom Head Under Jacket Property Number	301512	0
7	Center FEM Shell Property Number	302011	0
8	Outer FEM Shell Property Number (in cluster)	302012	0
9	Outer FEM Shell Property Number (in fluid)	302013	0
10			
11			
12			
13			
14	Water Density	0.00081	9.2522E-05
15	Liquid Density	0.05415	0.000140205
16	Concrete Density	0.0752	0.000194829
17	Steel Density	0.283	0.000755043
18			
19			
20			
21	Total Vessel Volume	30,461,914	16,648,216.64
22	Total FEM Cluster w/ Supports	3,713,472	2,009,761.21
23	Vessel Liquid	26,750,442	14,638,455.43
24			
25	FEM Cluster (Displacement Fluid Volume)	3,665,205	1,910,022.91
26	FEM Liquid (Volume)	3,665,205	1,910,022.91
27	FEM Cluster Concrete (Volume)	181,219	101,219.00
28	FEM Cluster Concrete (Surface Area)	703,686	398,686.00
29	FEM Cluster Steel (Surface Area)	17,879	9,879.00
30	FEM Cluster Steel (Volume)	202,789.72	113,789.72
31			
32	Horizontal FEM Cluster Supports (Displacement Fluid Volume)	32,458	17,458.00
33	Vertical FEM Cluster Supports (Displacement Fluid Volume)	32,458	17,458.00

Where is Simcenter Femap Going

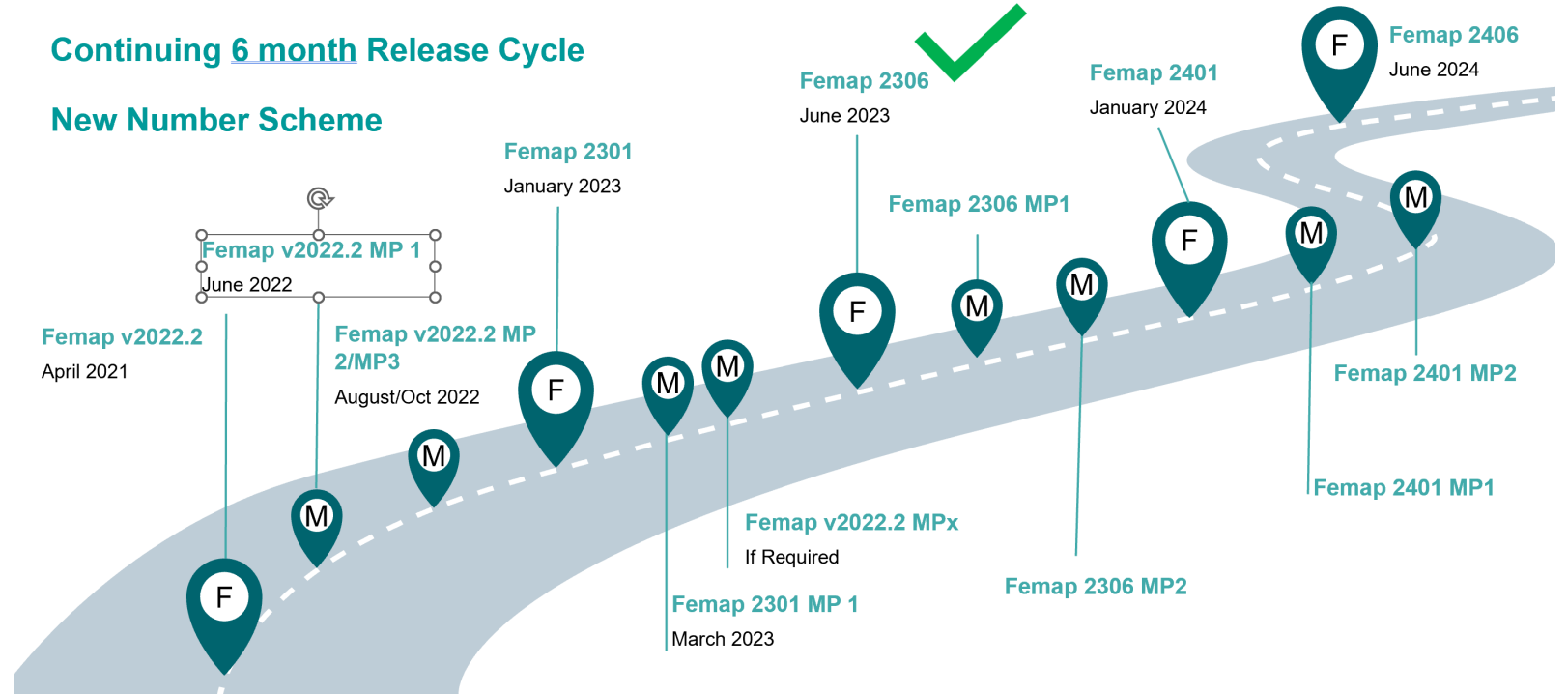
Is it Worth the Investment?



Simcenter Femap 2306 and Beyond Roadmap

Continuing 6 month Release Cycle

New Number Scheme



What is the Roadmap to be a SME's?

A Proven Method to Ensure Lifetime Simulation Employment

- 🚀 Take Time to Explore
- 🚀 Dedicate an hour every week to learning something about your specialty and document your effort
- 🚀 Attend technical seminars
- 🚀 Be brave and ask questions
- 🚀 Build simple models and explore new features
- 🚀 Share your expertise and experiences with others

APPLIED CAX

CAD - CAE - CAM - PLM

Simcenter Femap - NX - Teamcenter
Simcenter 3D - Simcenter STAR-CCM+ - Amesim