DRD TECHNOLOGY

# Ansys Structures Updates 2026R1 05/05/2026

Andrew Saliba – Structures Application Engineer

DRD

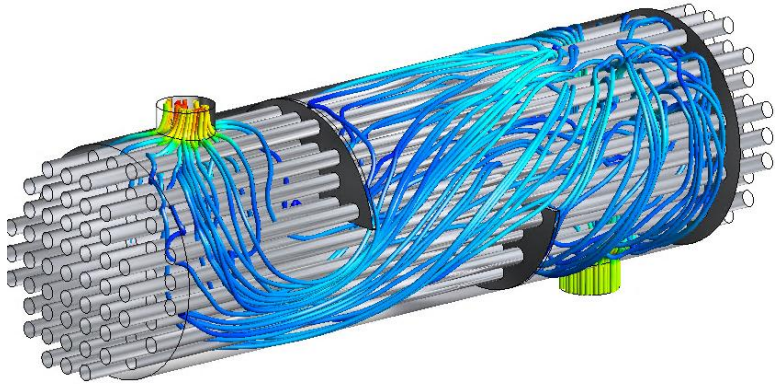
# Agenda

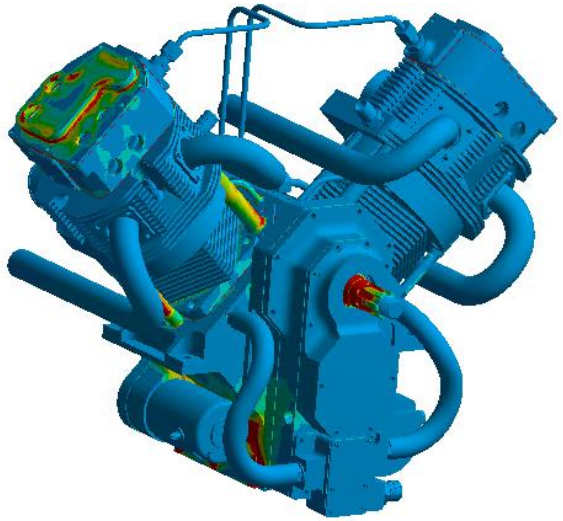
- Ansys Discovery
- Ansys Mechanical
  - Meshing
  - General
  - Structural Optimization
  - Motion
- Ansys Composite PrePost
- LS-Dyna
- Wrap Up

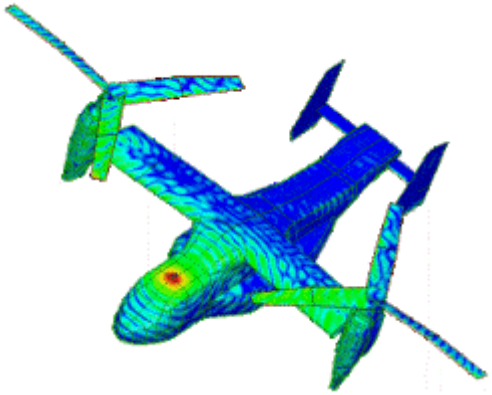
DRD

# Mission Statement

DRD Technology helps engineering teams accelerate product development. With in-house expertise spanning the entire range of physics, we ensure customers succeed when using Ansys simulation tools for virtual prototyping and design verification.







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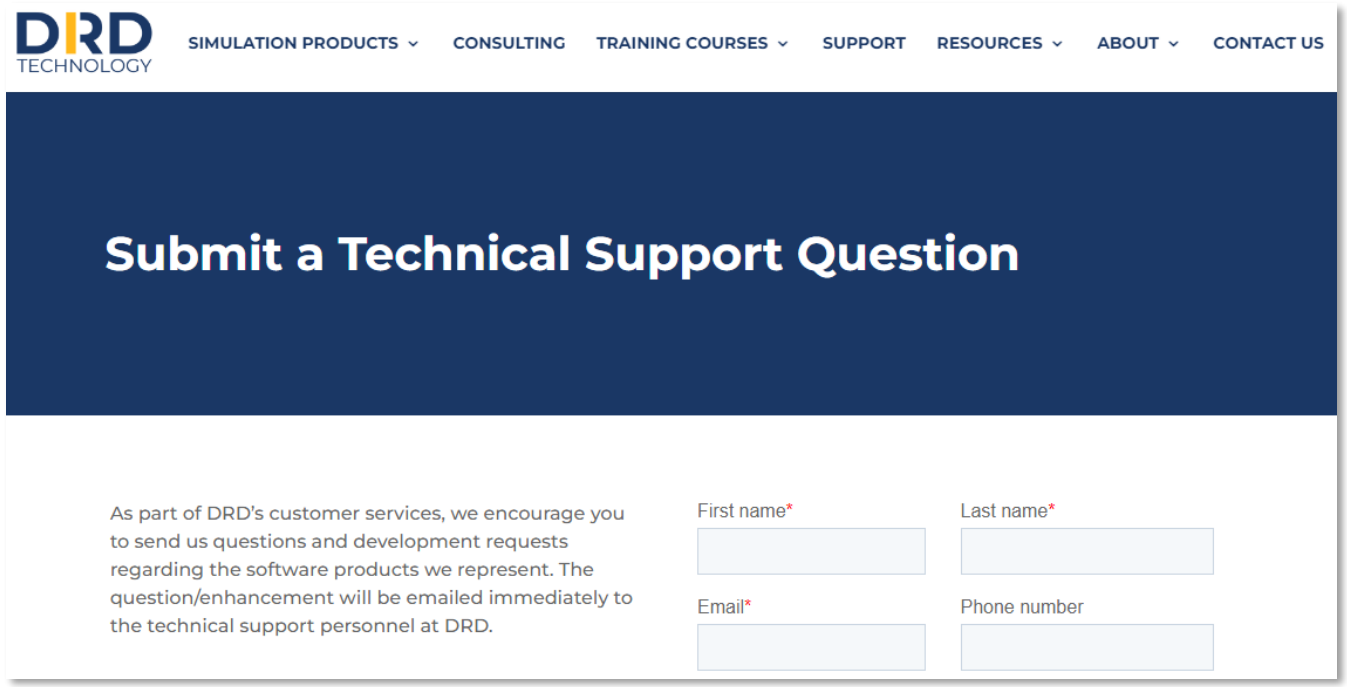
# Technical Support Contact Coordinates

**Support:**
**(918) 743-3013 x1**
**support@drd.com**

**Or through our website at**
**www.drd.com**




*For more than five years, I have worked closely with DRD Technology to execute tactical and strategic initiatives here at EaglePicher due to our unprecedented growth. We've been very happy with DRD and will continue to work with them as our business partner for using Ansys tools effectively and efficiently.*

*- Doug Austin*
*Director of Research and Development*
EaglePicher™ Technologies, LLC

# Who am I?

Andrew Saliba

Application Engineer in the Structures Group at DRD Technology

BS&MS in Mechanical Engineering at the University of Oklahoma

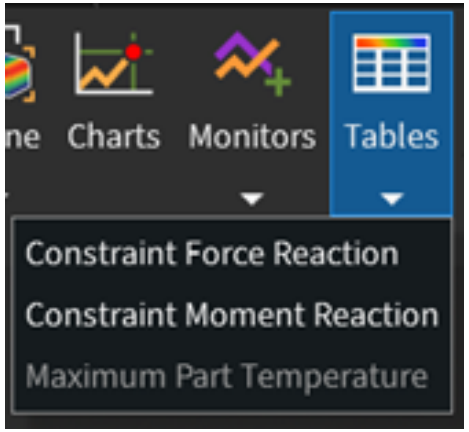
# Ansys Discovery

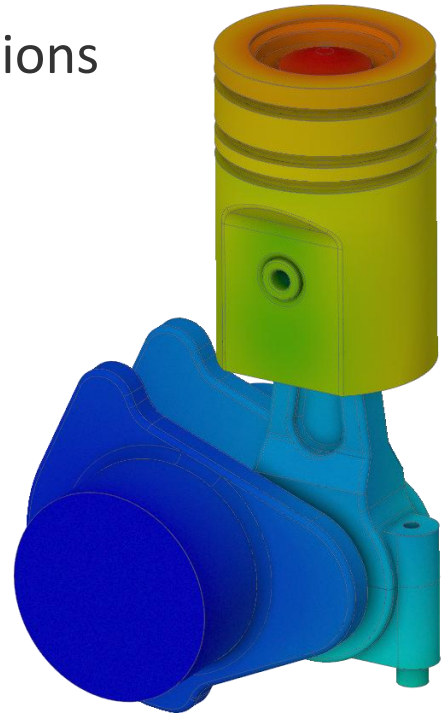
Structures

DRD

# Force and Moment Reaction Tables

- New force and moment reaction tables
  - Table includes force or moment reactions for all structural constraints
  - CSV export of reaction data
  - Improves ability to verify force and moment equilibrium



**Constraint Force Reaction**

| Constraint | X | Y | Z | Magnitude |
|---|---|---|---|---|
| Fixed Support 1 | -0.204 N | 86.9 N | 7.03e3 N | 7.03e3 N |
| Sliding Support 2 | -0.00155 N | -86.9 N | -0.00269 N | 86.9 N |
| Sliding Support 3 | -5.18 N | 1.62 N | -0.00373 N | 5.42 N |

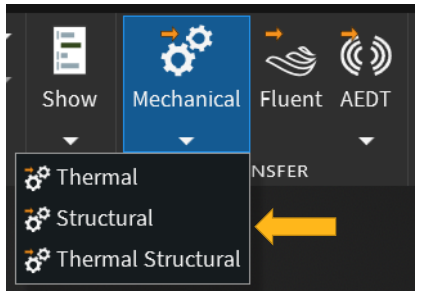
**Constraint Moment Reaction**

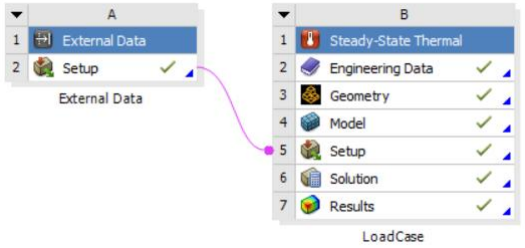
| Constraint | X | Y | Z | Magnitude |
|---|---|---|---|---|
| Fixed Support 1 | 267 N·m | -223 N·m | 1.73 N·m | 348 N·m |
| Sliding Support 2 | 47.7 N·m | 6.68e-5 N·m | -1.73 N·m | 47.8 N·m |
| Sliding Support 3 | 1.74 N·m | 0.0116 N·m | -0.00025 N·m | 1.74 N·m |

*Tabular output of force and moment reactions*

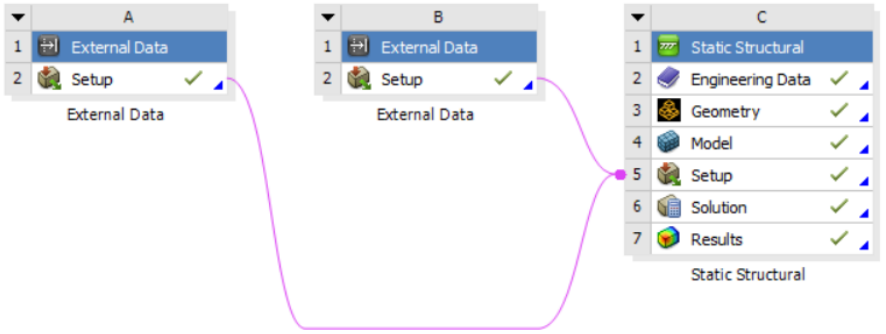
# Connection to Mechanical

- New options to transfer thermal and static pressure data to Mechanical from Discovery CHT simulation
  - Thermal
    - Transfers HTC values and near-wall fluid temperatures
  - Structural
    - Transfers volumetric temperature and static pressure
  - Thermal Structural
    - Transfers HTC values and near-wall fluid temperatures & static pressure
- Improves flexibility for thermal and thermal-stress downstream workflows

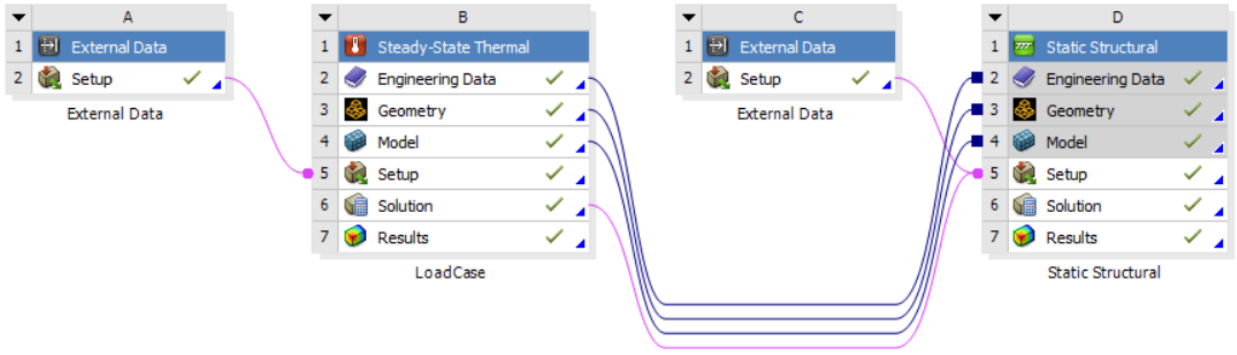



*Thermal*



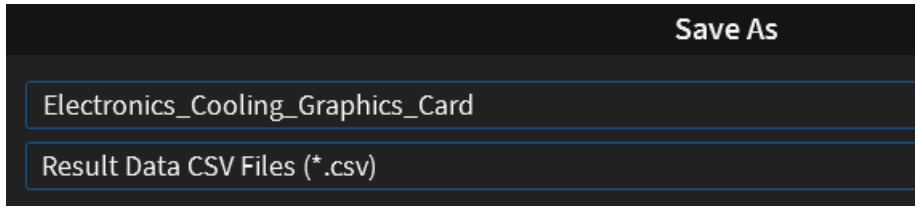

*Structural*




*Thermal Structural*

# Connection to Mechanical

- File -> Save As
  - Results Data CSV File
- Exports HTC & near-wall fluid temperatures, solid body temperatures and wall static pressure data to CSV files
- Available following either conjugate heat transfer or fluid simulation
- Enables data to be read into Mechanical via an External Data system




| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | X Location (m) | Y Location (m) | Z Location (m) | Temperature (C) | HTC |
| 2 | 0.0877 | 0.0960 | 0.0058 | 22.6421 | 147.3887 |
| 3 | 0.0755 | 0.0360 | 0.0274 | 31.9365 | 363.8599 |
| 4 | 0.0115 | 0.0629 | 0.0338 | 22.9476 | 132.5801 |
| 5 | 0.2460 | 0.0606 | 0.0114 | 22.1974 | 220.4411 |
| 6 | 0.0000 | 0.0510 | 0.0113 | 23.1186 | 161.8304 |
| 7 | 0.0000 | 0.0578 | 0.0288 | 23.1230 | 278.5240 |
| 8 | 0.2460 | 0.0694 | 0.0311 | 22.2116 | 192.8846 |
| 9 | 0.2460 | 0.0669 | 0.0306 | 22.2114 | 196.3162 |
| 10 | 0.0698 | 0.0735 | 0.0074 | 31.8580 | 91.3772 |
| 11 | 0.2460 | 0.0721 | 0.0311 | 22.2115 | 194.8946 |
| 12 | 0.1271 | 0.0276 | 0.0338 | 22.5668 | 126.8758 |
| 13 | 0.2269 | 0.0215 | 0.0047 | 22.2352 | 1087.0479 |
| 14 | 0.1881 | 0.0877 | 0.0036 | 22.1544 | 718.9384 |
| 15 | 0.2286 | 0.0511 | 0.0041 | 22.0900 | 1112.5809 |

Htc_Temperature

| | A | B | C | D |
|---|---|---|---|---|
| 1 | X Location (m) | Y Location (m) | Z Location (m) | Temperature (C) |
| 2 | 0.1669 | 0.0250 | 0.0041 | 25.8024 |
| 3 | 0.1755 | 0.0235 | 0.0028 | 24.4786 |
| 4 | 0.1769 | 0.0225 | 0.0041 | 24.3257 |
| 5 | 0.1769 | 0.0250 | 0.0016 | 24.4289 |
| 6 | 0.1769 | 0.0225 | 0.0016 | 24.2037 |
| 7 | 0.1769 | 0.0250 | 0.0041 | 24.5769 |
| 8 | 0.1744 | 0.0250 | 0.0016 | 24.6189 |
| 9 | 0.1755 | 0.0215 | 0.0029 | 24.2528 |
| 10 | 0.1750 | 0.0225 | 0.0041 | 24.4061 |
| 11 | 0.1747 | 0.0222 | 0.0016 | 24.3009 |
| 12 | 0.1769 | 0.0200 | 0.0041 | 24.1312 |
| 13 | 0.1744 | 0.0250 | 0.0041 | 24.7664 |
| 14 | 0.1731 | 0.0236 | 0.0027 | 24.7659 |
| 15 | 0.1769 | 0.0200 | 0.0016 | 24.1001 |

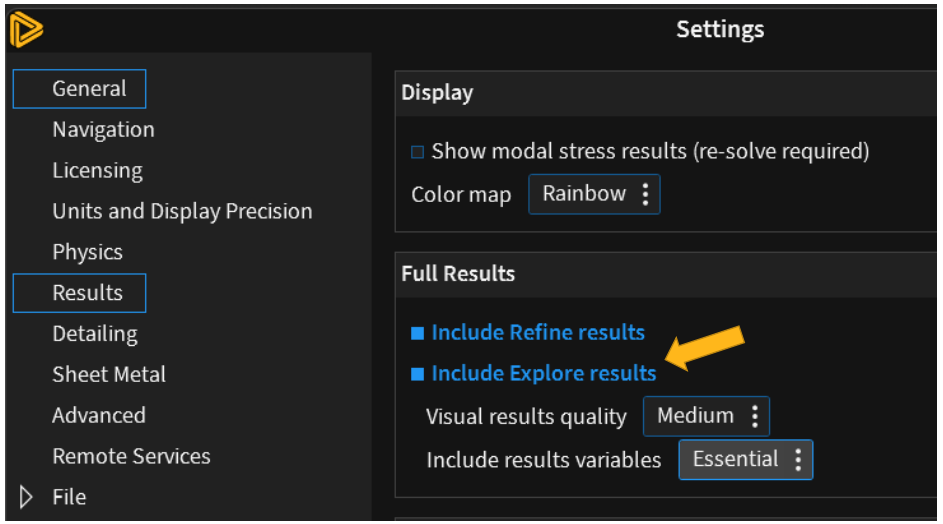
BodyTemperature

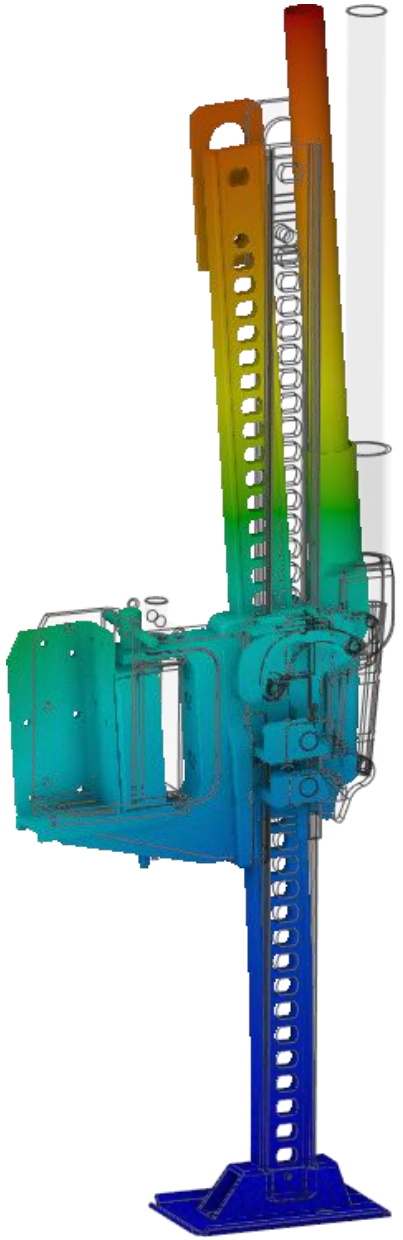
| | A | B | C | D |
|---|---|---|---|---|
| 1 | X Location (m) | Y Location (m) | Z Location (m) | Static Pressure (Pa) |
| 2 | 0.0877 | 0.0960 | 0.0058 | 8.5385 |
| 3 | 0.0755 | 0.0360 | 0.0274 | 8.4782 |
| 4 | 0.0115 | 0.0629 | 0.0338 | 7.9318 |
| 5 | 0.2460 | 0.0606 | 0.0114 | 9.1592 |
| 6 | 0.0000 | 0.0510 | 0.0113 | 7.0991 |
| 7 | 0.0000 | 0.0578 | 0.0288 | 2.8678 |
| 8 | 0.2460 | 0.0694 | 0.0311 | 9.0859 |
| 9 | 0.2460 | 0.0669 | 0.0306 | 9.1064 |
| 10 | 0.0698 | 0.0735 | 0.0074 | 8.4398 |
| 11 | 0.2460 | 0.0721 | 0.0311 | 9.0913 |
| 12 | 0.1271 | 0.0276 | 0.0338 | 8.9718 |
| 13 | 0.2269 | 0.0215 | 0.0047 | 8.6135 |
| 14 | 0.1881 | 0.0877 | 0.0036 | 8.6554 |
| 15 | 0.2286 | 0.0511 | 0.0041 | 8.6192 |

StaticPressure

# Results Persistence

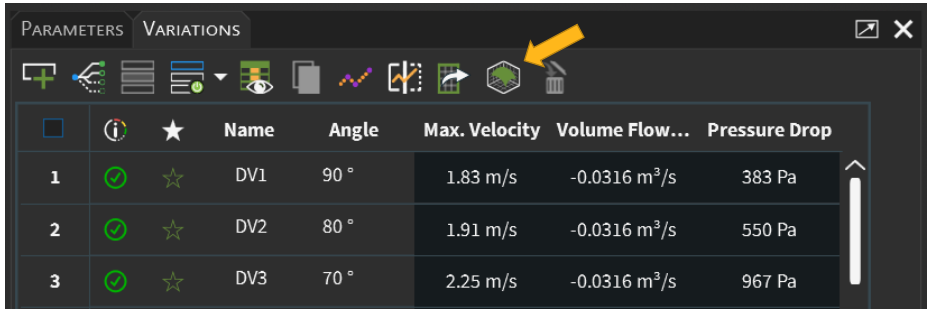
- Save Explore results to .dsco file
  - Resuming a file with results allows post-processing without resolving!
  - Increases .dsco file size while letting the user specify resolution quality or result variables to save

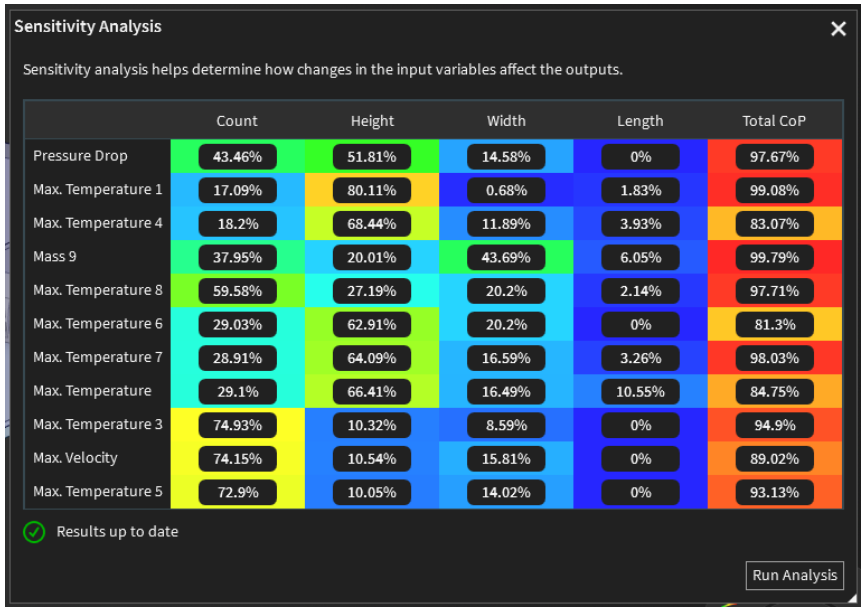


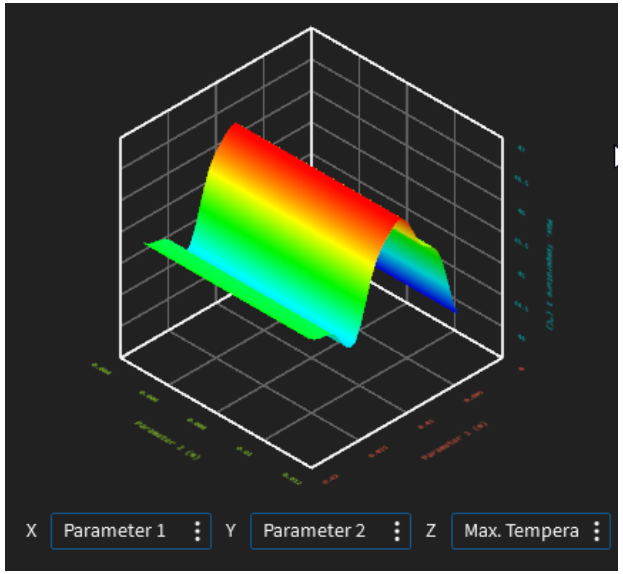



# Sensitivity Analysis

- Define variations now supports sensitivity analysis
  - Determines predictive quality and sensitivity matrix
  - 3D response surfaces plots
    - Visualize the relationship between inputs and output
  - Improves investigation of the influence of parameterized inputs on outputs



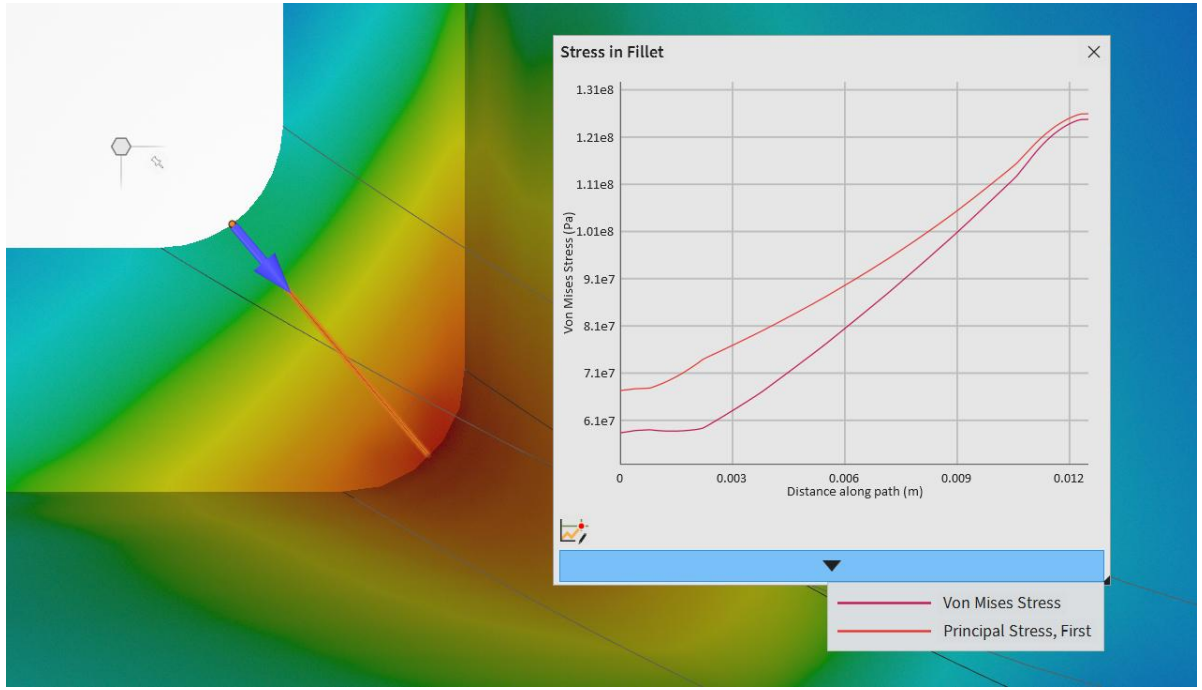



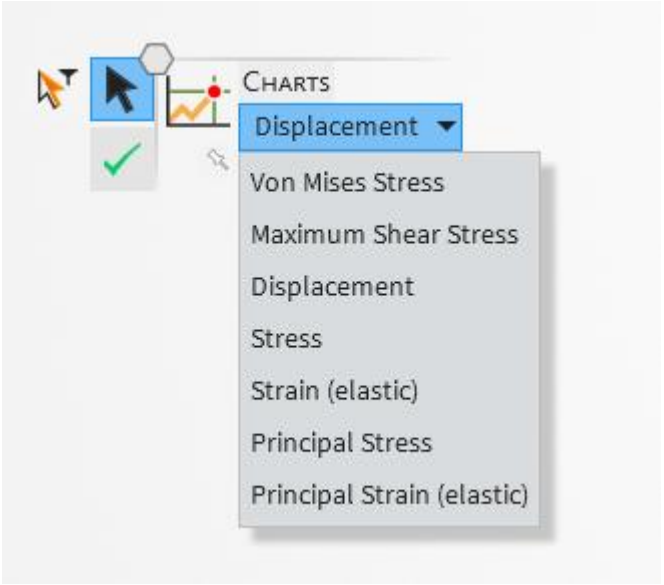




*Sensitivity analysis and response surface*

# Charts for Structural Results

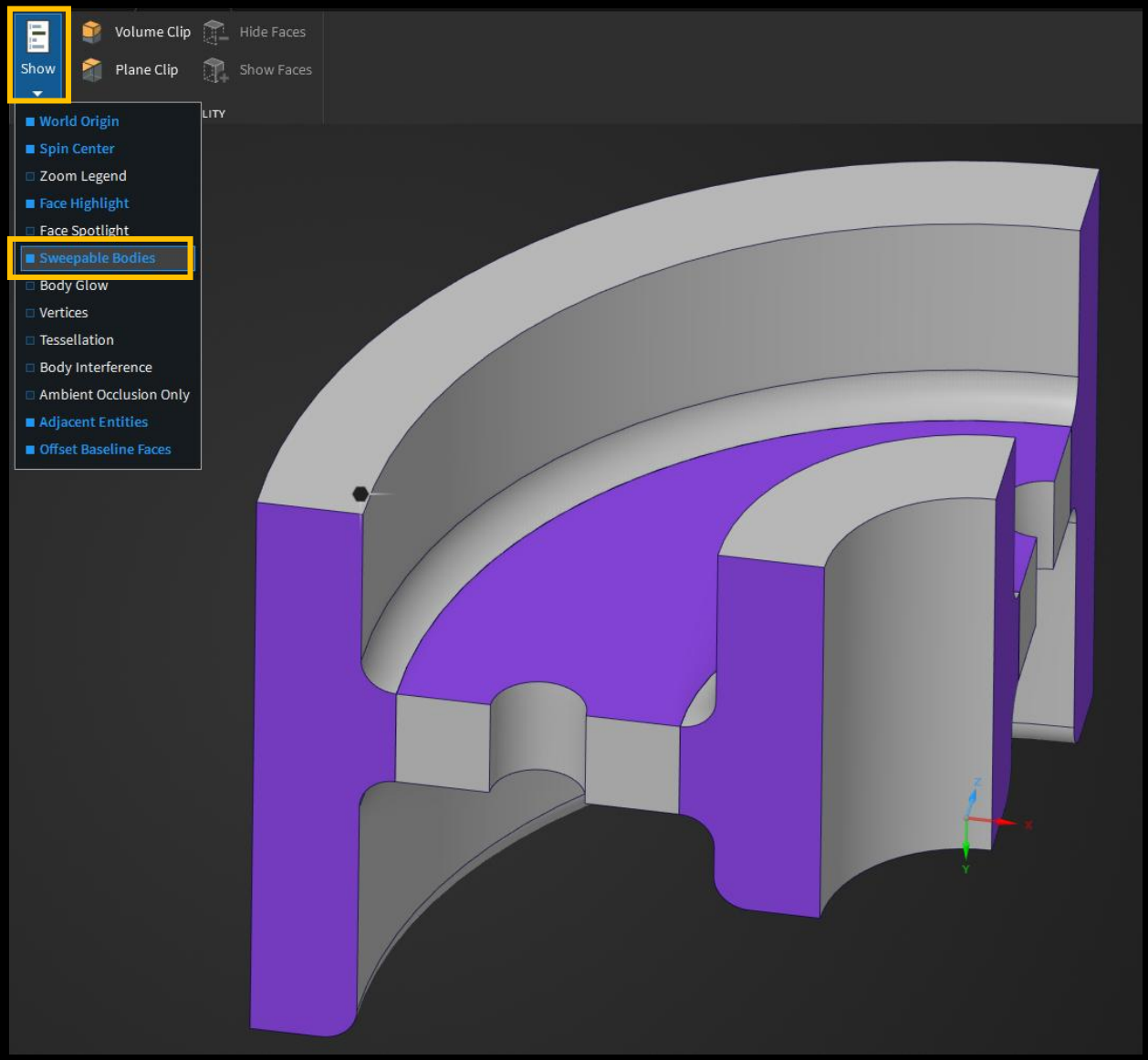
- Charts along an arbitrary path for structural results
  - Create charts of structural results along edges or sketched curves
  - Evaluate results through the thickness of components
  - Enhances structural post-processing

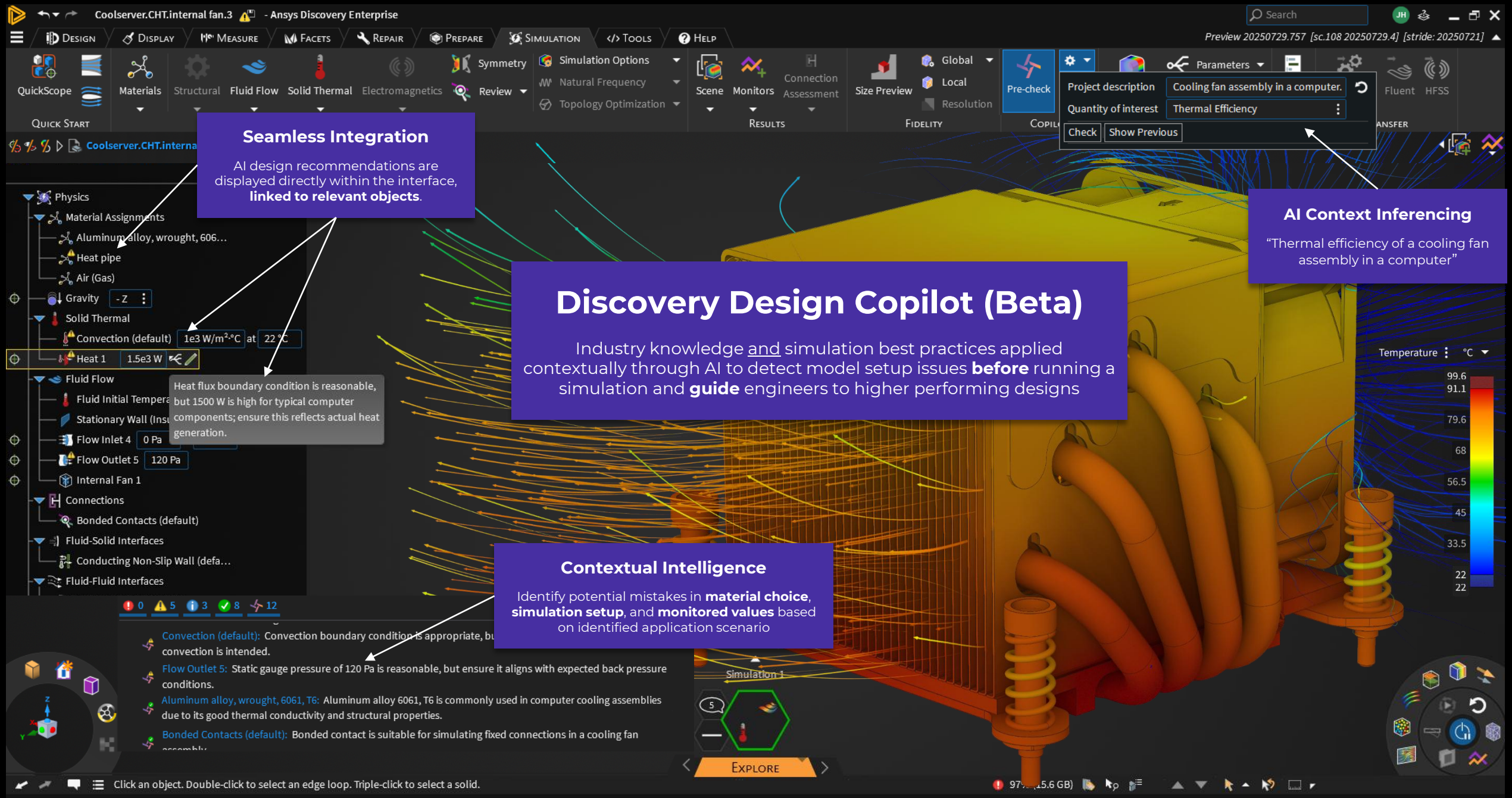


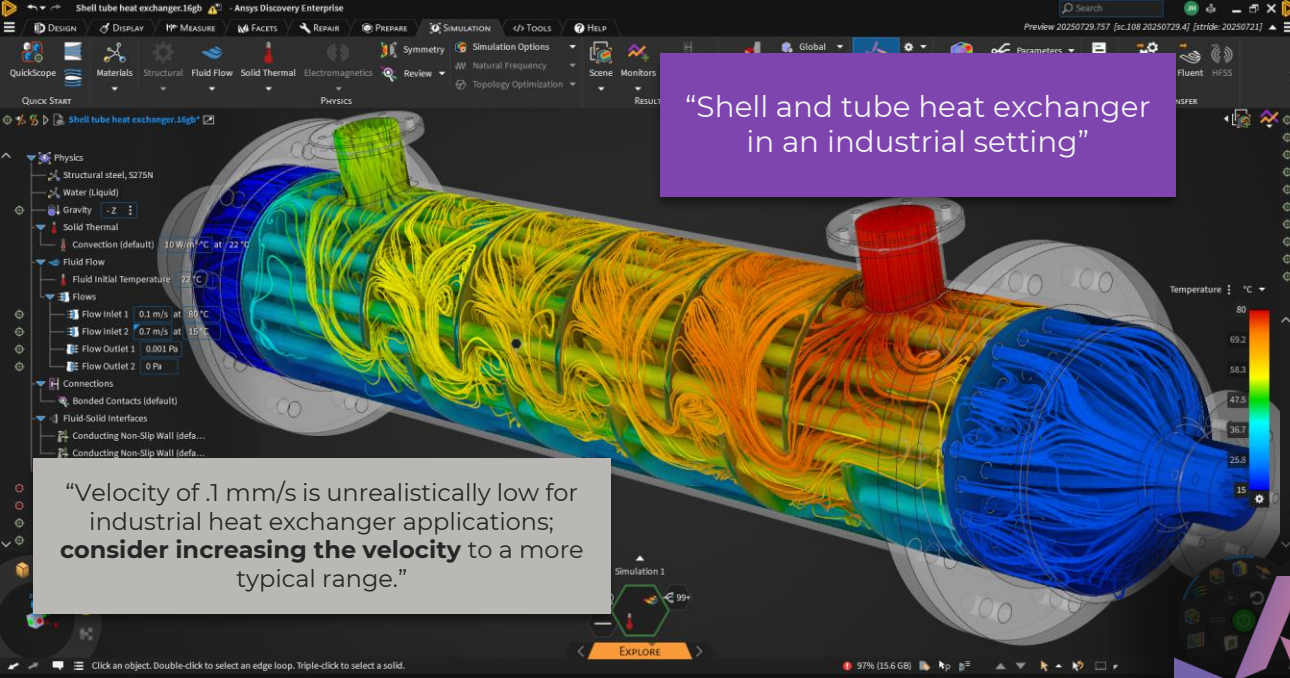
# Discovery - Show Sweepable

- Display option to color sweepable bodies
  - Non-Sweepable bodies become pink
  - Sweepable bodies become grey with purple source/target
  - As user slices bodies they are colored appropriately to show if they are sweepable
- Supports hex meshing preparation and avoid need to return to Discovery for new geometry edits



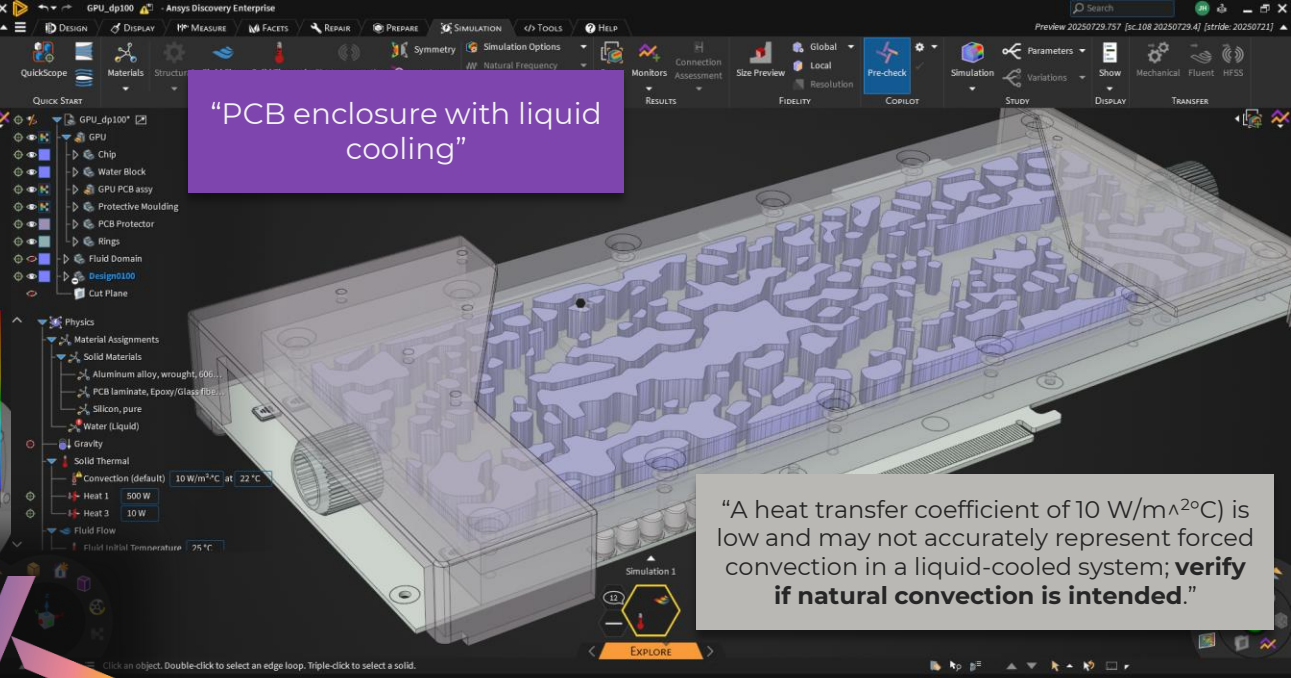

Coolserver.CHT.internal fan.3 - Ansys Discovery Enterprise
Search
Design
Display
Measure
Facets
Repair
Prepare
Simulation
Tools
Help
Preview 20250729.757 [sc.108 20250729.4] [stride: 20250721]
QuickScope
Materials
Structural
Fluid Flow
Solid Thermal
Electromagnetics
Symmetry
Review
Simulation Options
Natural Frequency
Topology Optimization
Scene
Monitors
Connection Assessment
Size Preview
Global
Local
Resolution
Pre-check
Parameters
Fluent
HFSS
Quick Start
Results
Fidelity
Project description
Cooling fan assembly in a computer.
Quantity of interest
Thermal Efficiency
Check
Show Previous
Physics
Material Assignments
Aluminum alloy, wrought, 606…
Heat pipe
Air (Gas)
Gravity
- Z
Solid Thermal
Convection (default)
1e3 W/m²·°C
at
22 °C
Heat 1
1.5e3 W
Fluid Flow
Fluid Initial Tempera
Stationary Wall (Insu
Flow Inlet 4
0 Pa
Flow Outlet 5
120 Pa
Internal Fan 1
Connections
Bonded Contacts (default)
Fluid-Solid Interfaces
Conducting Non-Slip Wall (defa…
Fluid-Fluid Interfaces
Heat flux boundary condition is reasonable, but 1500 W is high for typical computer components; ensure this reflects actual heat generation.
Seamless Integration
AI design recommendations are displayed directly within the interface, linked to relevant objects.
AI Context Inferencing
"Thermal efficiency of a cooling fan assembly in a computer"
Discovery Design Copilot (Beta)
Industry knowledge and simulation best practices applied contextually through AI to detect model setup issues before running a simulation and guide engineers to higher performing designs
Contextual Intelligence
Identify potential mistakes in material choice, simulation setup, and monitored values based on identified application scenario
Temperature
°C
99.6
91.1
79.6
68
56.5
45
33.5
22
22
0
5
3
8
12
Convection (default): Convection boundary condition is appropriate, bu
convection is intended.
Flow Outlet 5: Static gauge pressure of 120 Pa is reasonable, but ensure it aligns with expected back pressure conditions.
Aluminum alloy, wrought, 6061, T6: Aluminum alloy 6061, T6 is commonly used in computer cooling assemblies due to its good thermal conductivity and structural properties.
Bonded Contacts (default): Bonded contact is suitable for simulating fixed connections in a cooling fan
Simulation 1
Explore
Click an object. Double-click to select an edge loop. Triple-click to select a solid.

“Shell and tube heat exchanger in an industrial setting”



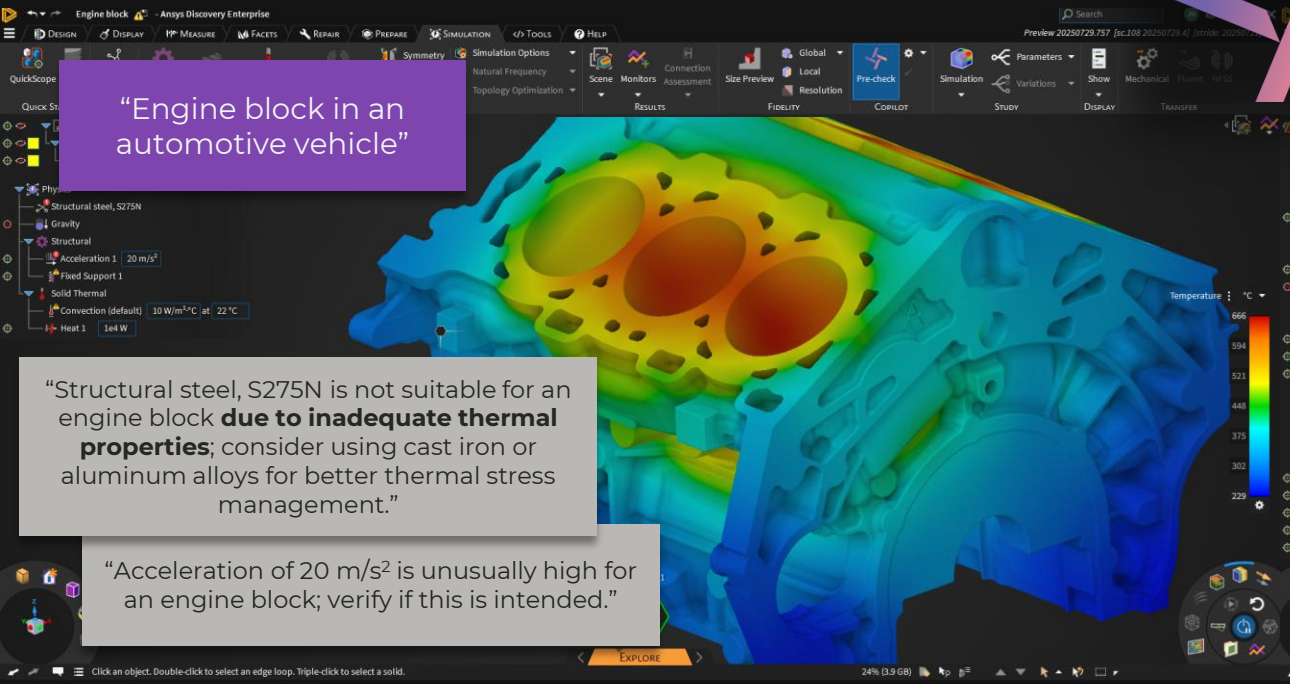
“Velocity of .1 mm/s is unrealistically low for industrial heat exchanger applications; **consider increasing the velocity** to a more typical range.”

“PCB enclosure with liquid cooling”



“A heat transfer coefficient of 10 W/m^2°C) is low and may not accurately represent forced convection in a liquid-cooled system; **verify if natural convection is intended**.”

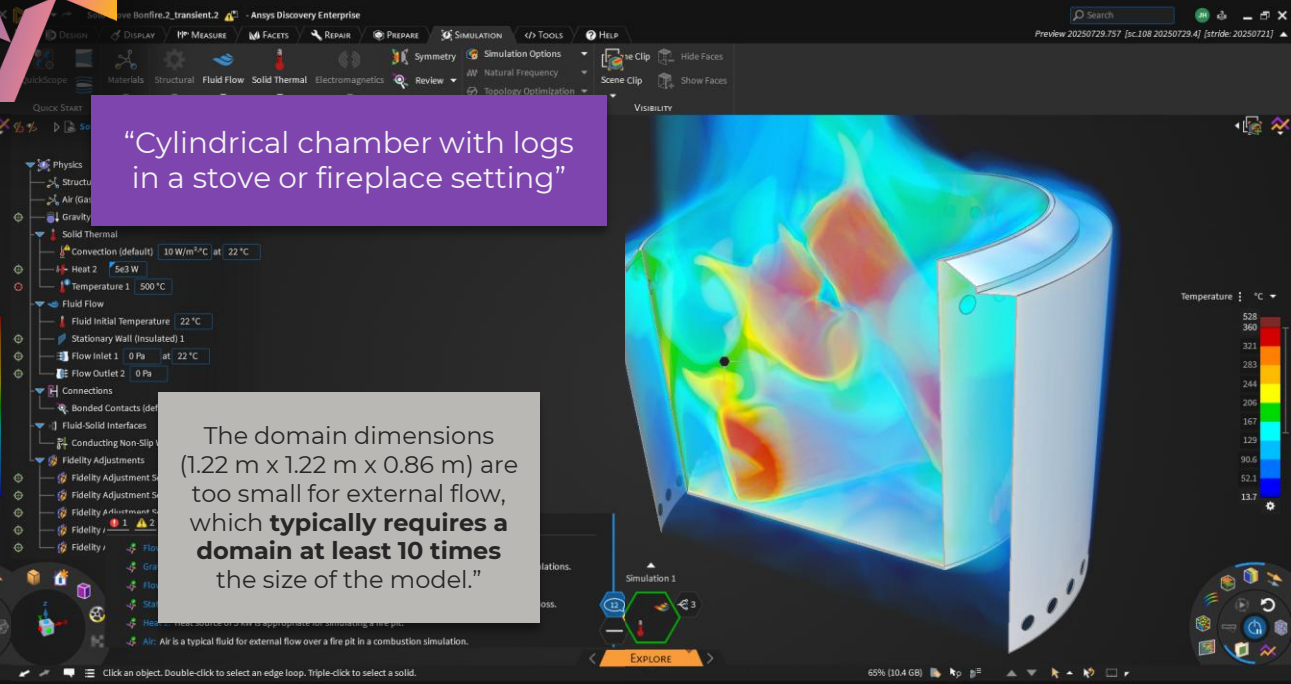
“Engine block in an automotive vehicle”



“Structural steel, S275N is not suitable for an engine block **due to inadequate thermal properties**; consider using cast iron or aluminum alloys for better thermal stress management.”

“Acceleration of 20 m/s² is unusually high for an engine block; verify if this is intended.”

“Cylindrical chamber with logs in a stove or fireplace setting”



The domain dimensions (1.22 m x 1.22 m x 0.86 m) are too small for external flow, which **typically requires a domain at least 10 times** the size of the model.”

# Ansys Mechanical

Meshing

DRD

# Mechanical Meshing Enhancements in 2026R1

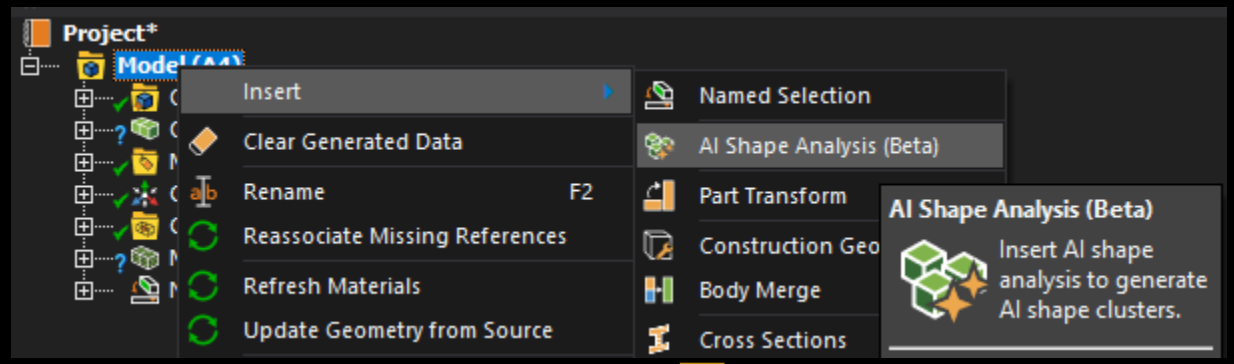
- **Ease of Use**
  - AI Shape Analysis (Beta)
  - Mechanical Physics Preference: Sizing Type and Mesh Optimization
- **Mesh Workflows**
  - Usability enhancements
  - Revolve (Beta)
  - Enhanced hex meshing options for MultiZone
- **NVH Meshing**
  - Usability improvements for acoustics mesh workflow
  - Release of FSI acoustic workflow template
  - Extrude enhancements: with scaling, with topology
- **Meshing for Electronics**
  - Improvements to Stacker Mesh Workflow
    - Improved performance and robustness
    - UX improvements
    - Improvement and release of solder ball creation template
- **Morphing**
  - Release of Direct Morphing mesh workflow
    - Transfer to workflow via Clone Mesh
      - Passing of Named Selections as labels for morphing
    - Morph control improvements with previews for control scopes
  - Release of Mesh Edit/Morph Control
  - Improved control inputs
  - Beta Features: Fillet Morphing, Match Morph→Project to Plane, Transforms
- **Hex Meshing**
  - MultiZone (MZ) Enhancements
  - Mesh Pull improved for consistent offset thickness in corners
  - MZ Axis Sweep – Improved section and thin region meshing (Beta)
  - Released from Beta: MultiZone Advanced Smoothing, Topology Suppress
- **Tet Meshing**
  - Auto Geometry Fidelity on Contact surfaces (Beta)
  - Refine at thin section support for 4 elements (Beta)
- **Welds and Shell Meshing**
  - Beam and Shell/Weld improvements
  - Prime Quad: sizing improvements, mapped meshing with MultiZone
- **Meshing Performance**
  - Parallel in-part body-group meshing

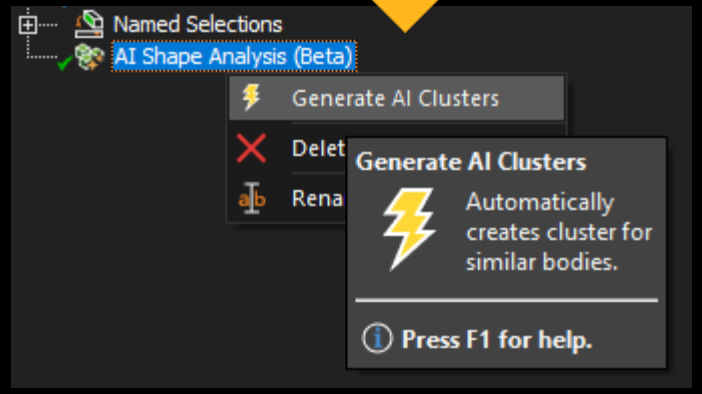
# Ansys Mechanical

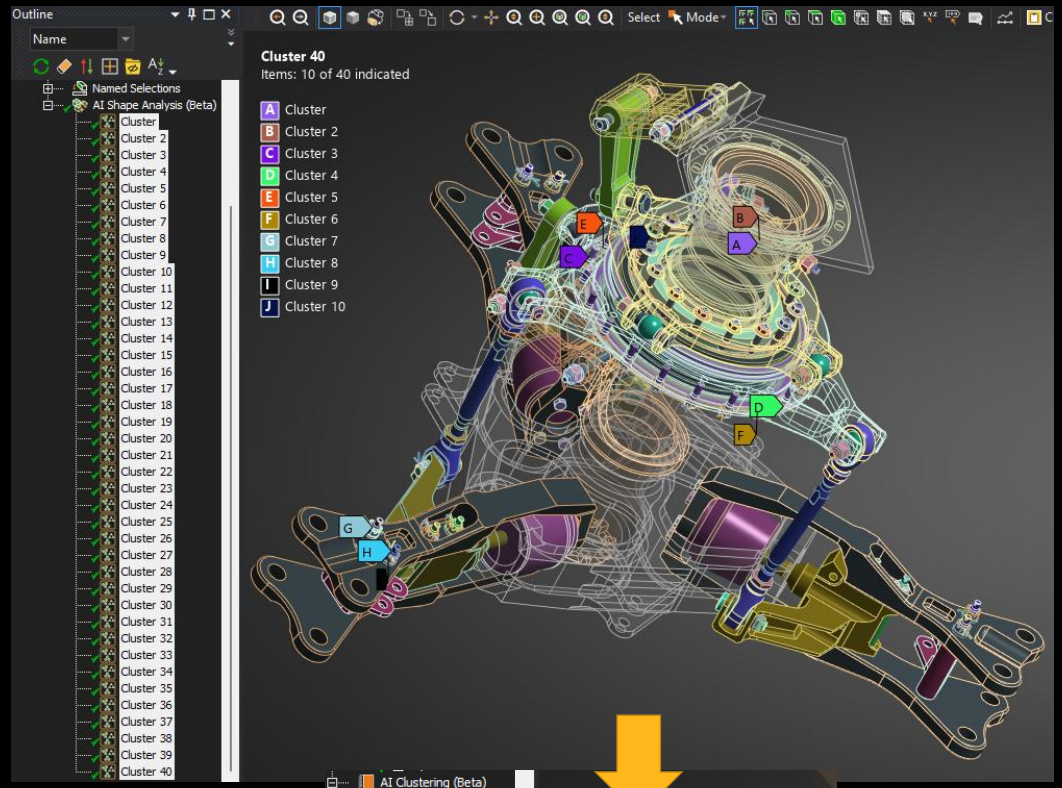
Usability UI/UX

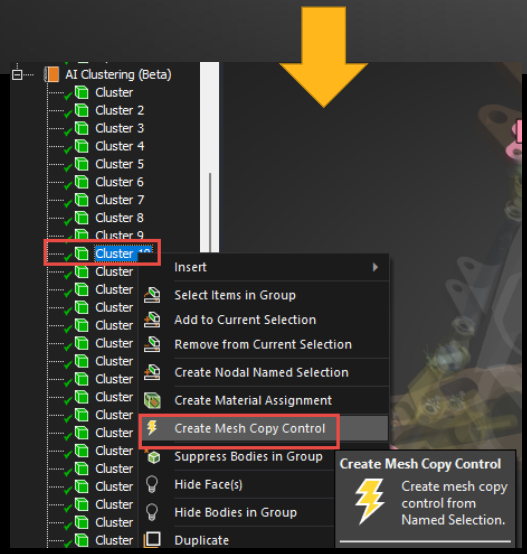
DRD

# AI Shape Analysis (Beta)



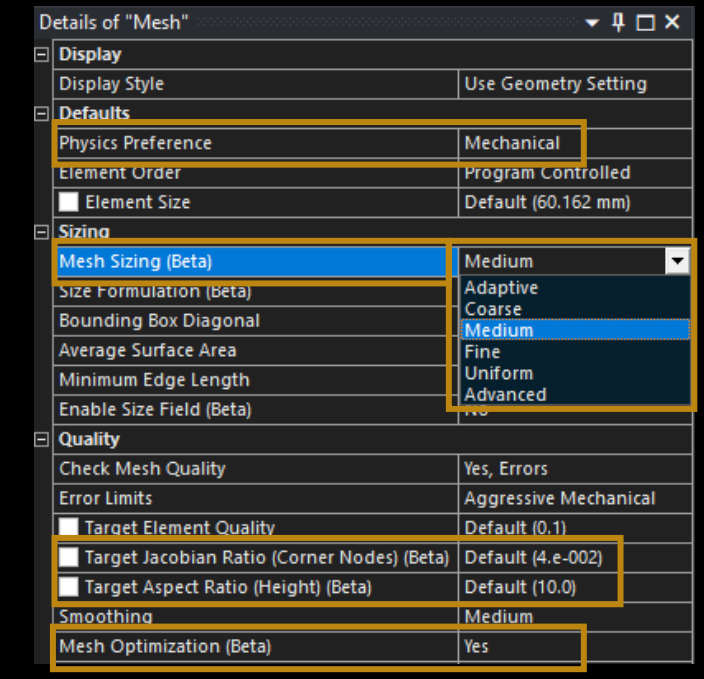

- Find similar bodies and quickly create NS groups and/or Mesh Copy controls

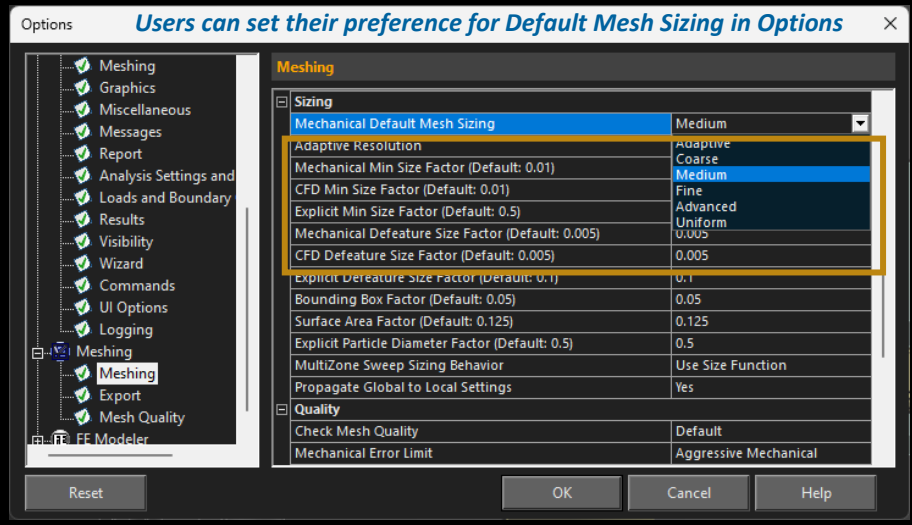
# New Simplified Settings for Mesh Sizing

- For Mechanical Physics Preference two new options appear:
  - Mesh Sizing
    - Coarse
    - Medium
    - Fine
    - Uniform
    - Advanced
    - Adaptive

***Simple controls with low # of inputs for novice users, aiming for high quality***

    - Coarse/Medium/Fine/Uniform options now simplify parameter inputs by automatically changing Curvature and Defeaturing parameters
    - "Advanced" gives access to all the controls (curvature angle, growth rates etc, equivalent to previous "Adaptive=No" behaviour)
    - Adaptive sets Adaptive Sizing (remains default for robustness purposes)
  - Mesh Optimization
    - This is enabled by default if beta is on and is only visible for Mech Physics preference
    - It enables Aspect Ratio targeting and auto-mapping of cylinder faces where possible
    - Target JR and AR become available as target quality metrics



# Coarse/Med/Fine/Uniform Settings

- Element Size remains calculated based on Bounding box factor by default as usual
  - Default Element Size is 0.05*Assembly Bounding Box Diagonal
- The new sizing formulation changes only the Defeaturing Size, curvature refinement parameters, Growth Rate and Max (volume) size
- As we crank up the refinement from Coarse to Fine we will see
  - Holes/fillets etc being resolved better
  - More gradual growth in the mesh
  - Defeaturing being less aggressive to keep more features
    - For complex or poorly defined geometry, this may cause failures and user may need to add local Body Sizing controls with local defeaturing sizes to successfully mesh
- A fallback mechanism is in place to retry meshing of failed bodies automatically with Adaptive sizing
  - Can be disabled in Mesh Options

| | Coarse | Medium | Fine | Uniform |
|---|---|---|---|---|
| **Growth Rate** | 1.8 | 1.65 | 1.5 | 1.2 |
| **Defeature Size Factor** | 0.025 | 0.01875 | 0.0125 | 0.1 |
| **Capture Curvature** | Yes | Yes | Yes | No |
| **Curvature Min Size Factor** | 0.1 | 0.075 | 0.05 | N/A |
| **Curvature Normal Angle** | 60 | 45 | 30 | N/A |
| **Max Size Factor** | 2 | 2 | 2 | 1 |
| **Mesh Optimization** | Yes | Yes | Yes | Yes |

***Factor → Multiplied by Element Size***

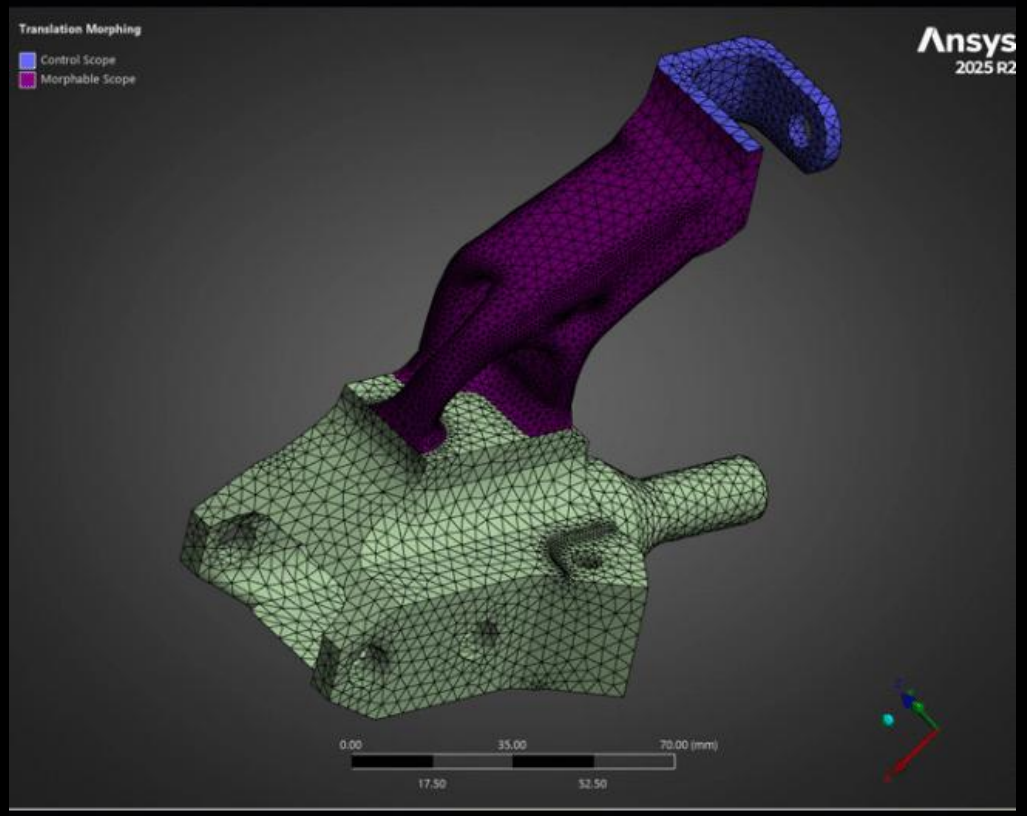
# Ansys Mechanical

Morphing

DRD

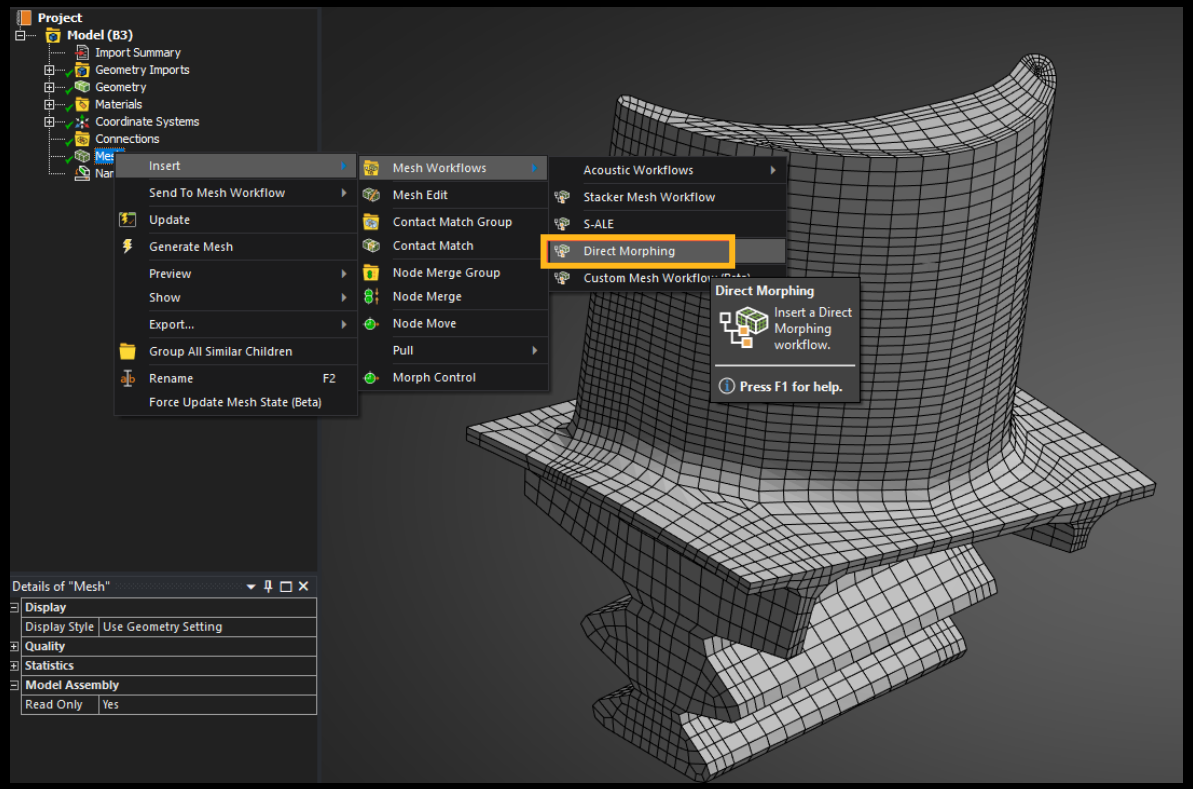
# What is Morphing?

- Morphing is a technology that allows users to select points in the mesh and move them with a prescribed transformation and to give a smooth interpolation for a “morphable” layer between the moving and the fixed nodes so as not to destroy the mesh integrity
- The morphing transformation could involve pulling in the normal direction to a surface, a translation or rotation, a scaling or a projection to another shape.
- The morphing will retain mesh layout and the geometry topology generally cannot be changed (major features cannot be added/removed by morphing).
- Morphing can be done inside the Mechanical environment to make geometry changes or perform DOE studies on Windows or Linux with little set-up.

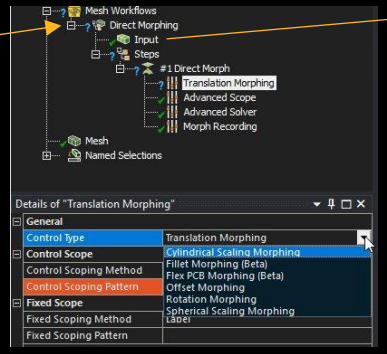


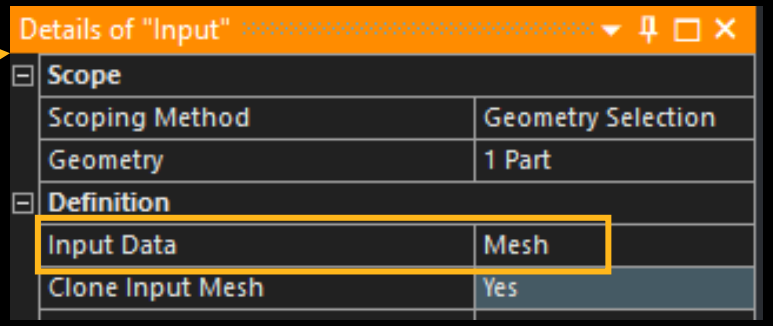
# Release of Direct Morph Workflow

- Send meshed bodies to Direct Morphing Workflow
- Mesh can be created in Mechanical or imported via External Model
  - Mesh Workflow Input now supports transfer of Mesh



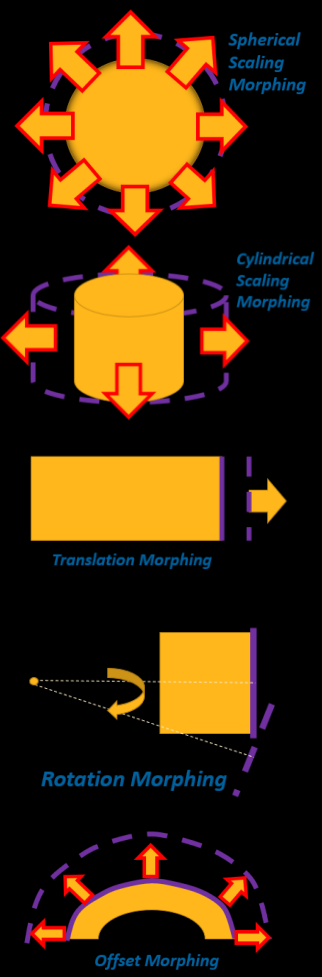


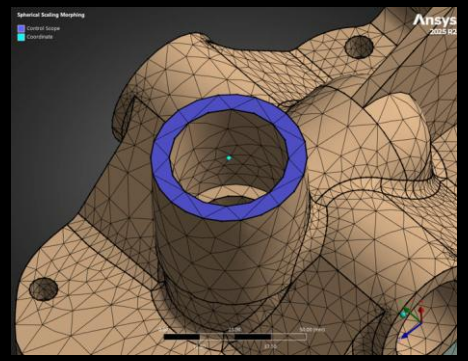


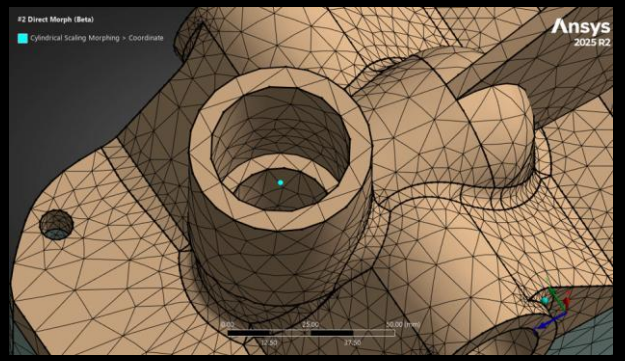



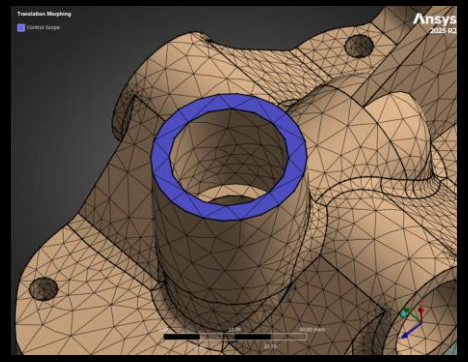
# Morphing in Mesh Workflows

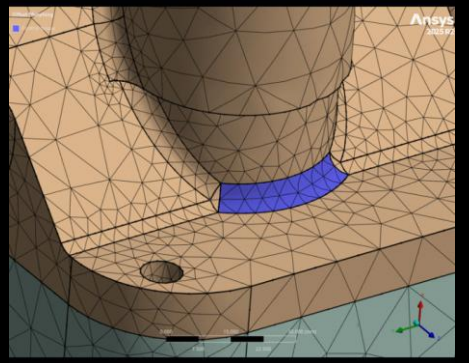
- Extensive set of controls available for morphing
  - Spherical Scaling
  - Cylindrical Scaling
  - Translation
  - Rotation
  - Offset
  - Match Morphing (Source to Target)
  - Bending for Flexible PCB (Beta)
- Supports shell and solid meshes
- Supports linear and quadratic meshes

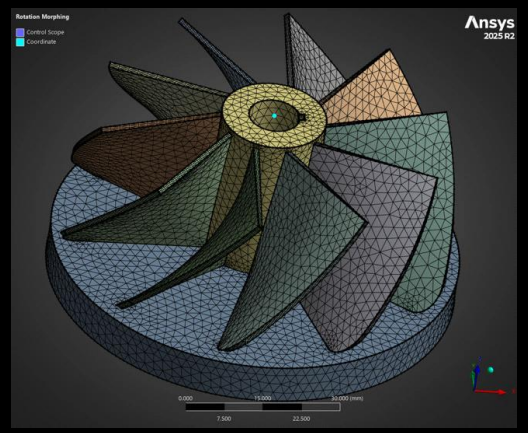


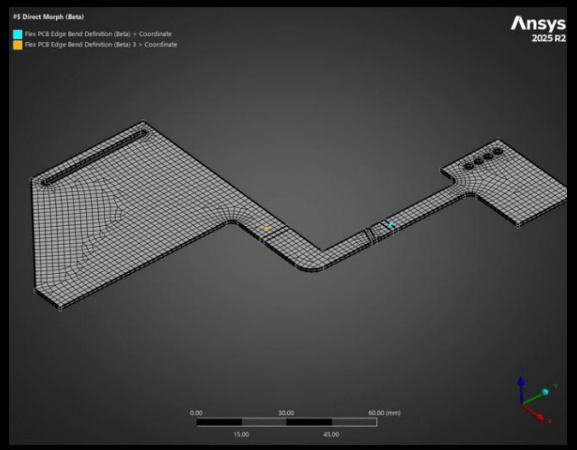



# Ansys Mechanical

## Hex Meshing

DRD

# MultiZone: New Program Controlled Decomposition Behaviour

The MultiZone algorithm automatically determines the geometry type of bodies based on an evaluation of the geometry data: axis-symmetric, thin, or “other” and applies one of three meshing strategies:

- Axis-Sweep for axis-symmetric bodies
- Thin-Sweep for thin solids
- Standard for all others or as “fall-back” (upon failure)

### *Version 25.2 Logic*

- **Single Body**:
  - If axis-symmetric → Axis-Sweep
  - Else if thin (no curved source/target surfaces) → Thin-Sweep
  - Else → Standard
- **Multiple Bodies with Shared Topology**:
  - Treated as one combined body, ignoring shared surfaces
  - Same logic applied: Axis-Sweep → Thin-Sweep → Standard

### *Version 26.1 Enhancements*

- **Smarter Program Controlled Algorithm**:
  - If no axis-symmetric or sweepable bodies → checks for thin solids → If no thin solids exist → Standard
- **Single Body**: Same logic as 25.2
- **Multiple Bodies**:
  - Evaluated **individually**
  - Grouped by decomposition type: axis-symmetric, thin, others
  - Each group re-evaluated for **restrictions**:
    - **Axis-symmetric restrictions**: no protected topology, inflation, face mesh control, or imprints
    - **Thin body restrictions**: can't be surrounded by 'others', connected to axis-symmetric bodies, or have sweep conflicts
  - Thin bodies are rechecked for structural complexity or simplicity (e.g. boxes) that may force fall-back to Standard

### Final Meshing Order

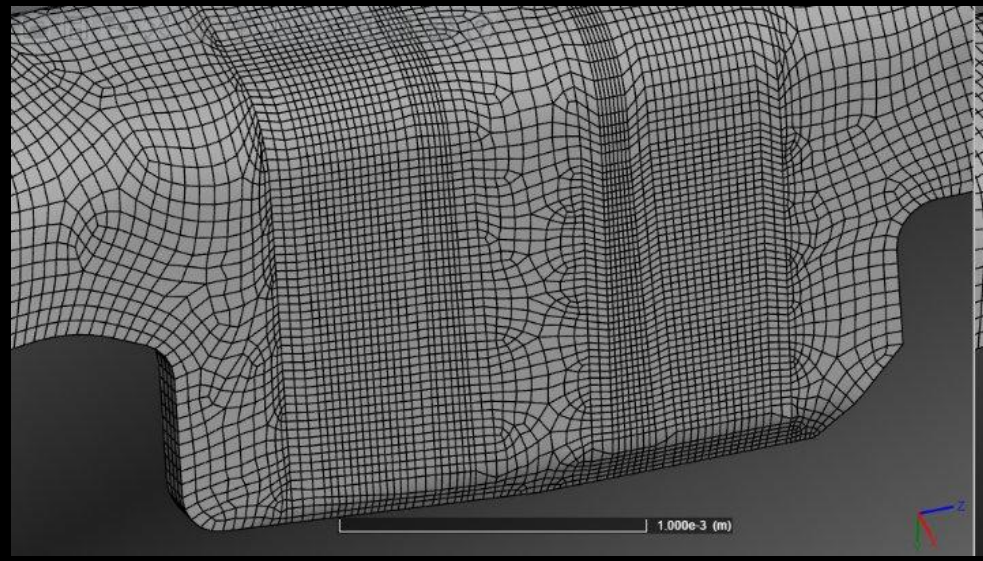
1. **Axis-symmetric bodies** → Axis-Sweep
2. **Other bodies** → Standard
3. **Thin bodies** → Thin-Sweep

# MultiZone: Enable Smoothing

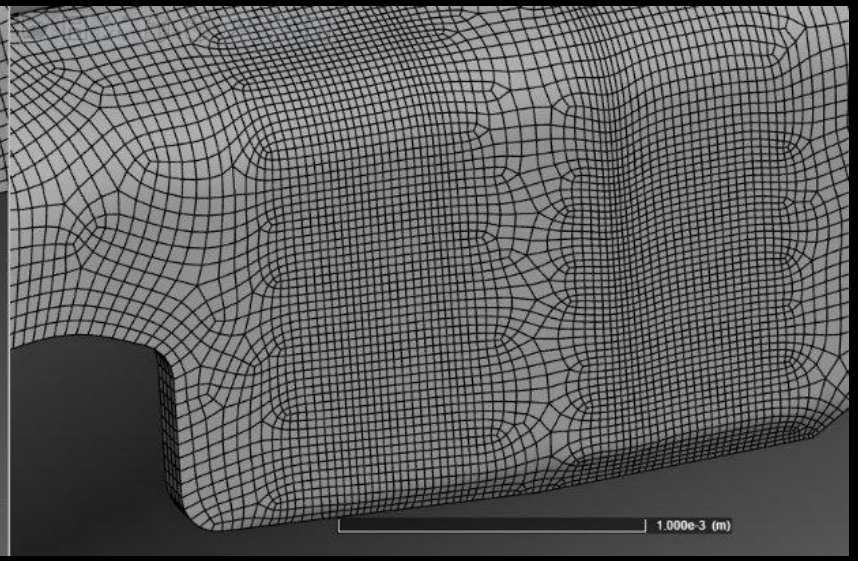
- A new Advanced MultiZone Method option **Enable Smoothing** can now be invoked which aims to give smooth size change in all directions across “blocks” and within bodies
- **Freeze Inflation Layers** allows or disallows smoothing of inflation layers during MultiZone meshing

| Details of "MultiZone" - Method | |
|---|---|
| **Scope** | |
| Scoping Method | Geometry Selection |
| Geometry | 6 Bodies |
| **Definition** | |
| Suppressed | No |
| Method | MultiZone |
| Decomposition Type | Program Controlled |
| Mapped/Swept Type | Hexa |
| Surface Mesh Method | Program Controlled |
| Free Mesh Type | Not Allowed |
| Element Order | Use Global Setting |
| Src/Trg Selection | Automatic |
| Src/Trg Scoping Method | Program Controlled |
| Source(s) and Target(s) | Program Controlled |
| Sweep Size Behavior | Sweep Element Size |
| Sweep Element Size | Default |
| Element Option | Solid |
| **Advanced** | |
| Preserve Boundaries | Protected |
| Mesh Based Defeaturing | Off |
| Minimum Edge Length | 1.e-003 m |
| Write ICEM CFD Files | No |
| Use Split Angle | No |
| Enable Smoothing | Yes |
| Freeze Inflation Layers | No |

*Smoothing Off*

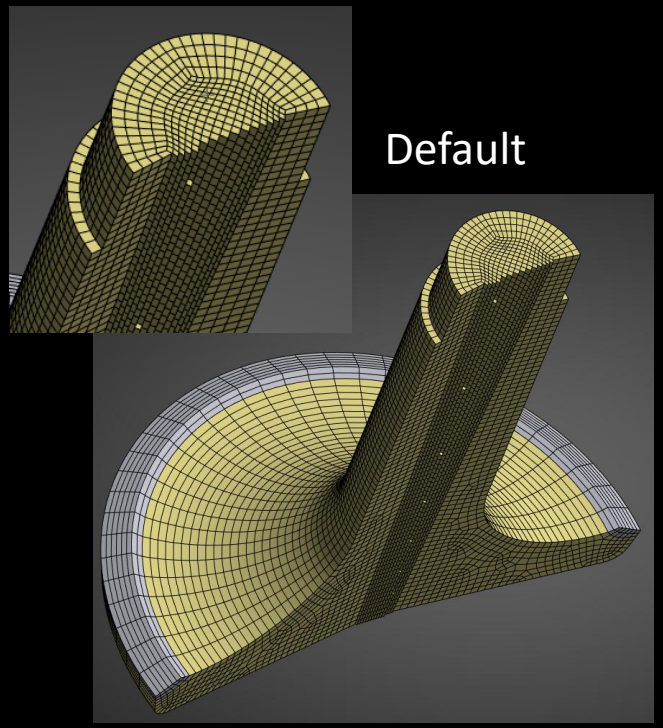



*Smoothing On*

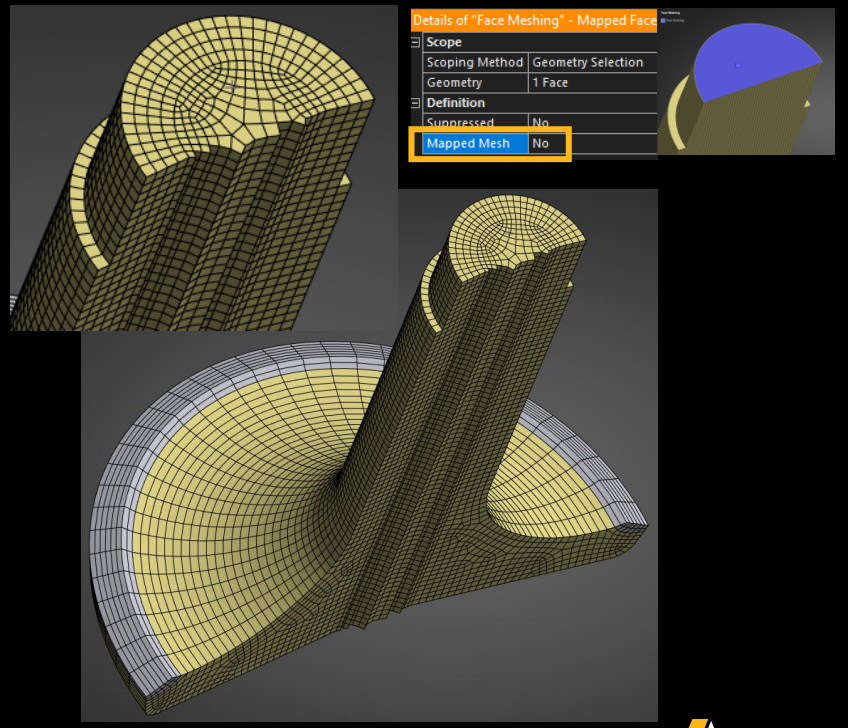


# MultiZone Axis-Sweep: Mapped Mesh = No for Unstructured Axis Mesh

- User can now add Face Meshing Controls with Mapped Mesh = No to avoid the structured O-Grid
  - Gives more uniform mesh (avoids small elements)
  - Reduces node count

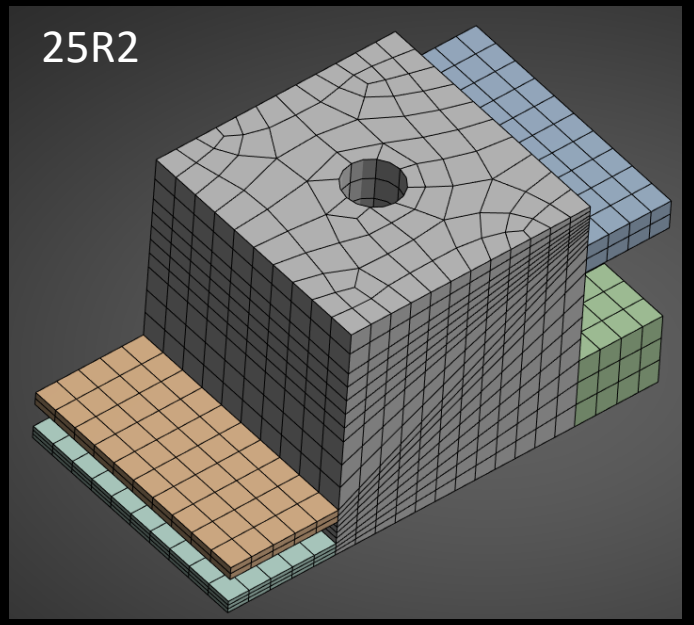


Default

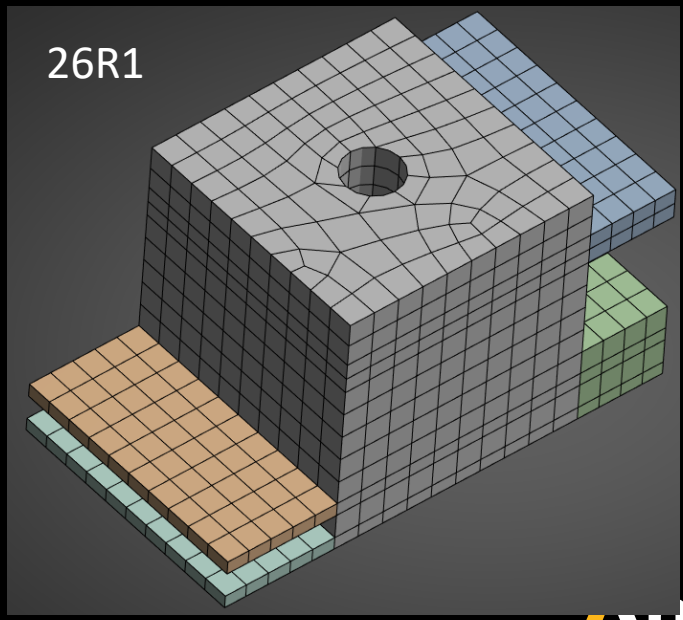


# MultiZone Split Angle Improvements

- MultiZone Split Angle option for more orthogonal block splits has been enhanced to better support Multi-body parts when all bodies are meshed together
  - Bodies that are meshed together are “blocked” together




| Details of "MultiZone" - Method | |
|---|---|
| **Scope** | |
| Scoping Method | Geometry Selection |
| Geometry | 5 Bodies |
| **Definition** | |
| Suppressed | No |
| Method | MultiZone |
| Decomposition Type | Program Controlled |
| Mapped/Swept Type | Hexa |
| Surface Mesh Method | Program Controlled |
| Free Mesh Type | Not Allowed |
| Element Order | Use Global Setting |
| Src/Trg Selection | Automatic |
| Src/Trg Scoping Method | Program Controlled |
| Source(s) and Target(s) | Program Controlled |
| Sweep Size Behavior | Sweep Element Size |
| Sweep Element Size | Default |
| Element Option | Solid |
| **Advanced** | |
| Preserve Boundaries | Protected |
| Mesh Based Defeaturing | Off |
| Minimum Edge Length | 1.0276e-003 m |
| Write ICEM CFD Files | No |
| Reuse Blocking (Beta) | Off |
| Use Split Angle | Yes |
| Split Angle | 60.0° |



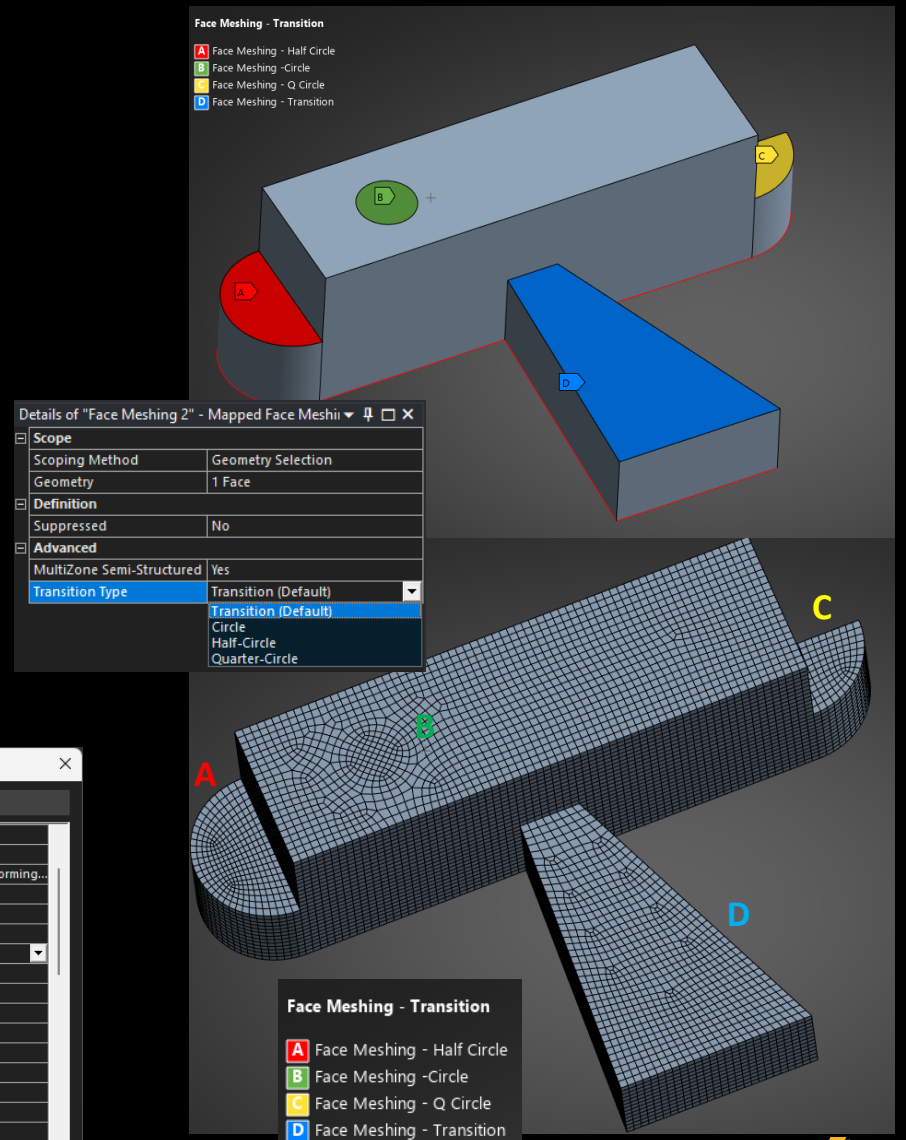
# Ansys Mechanical

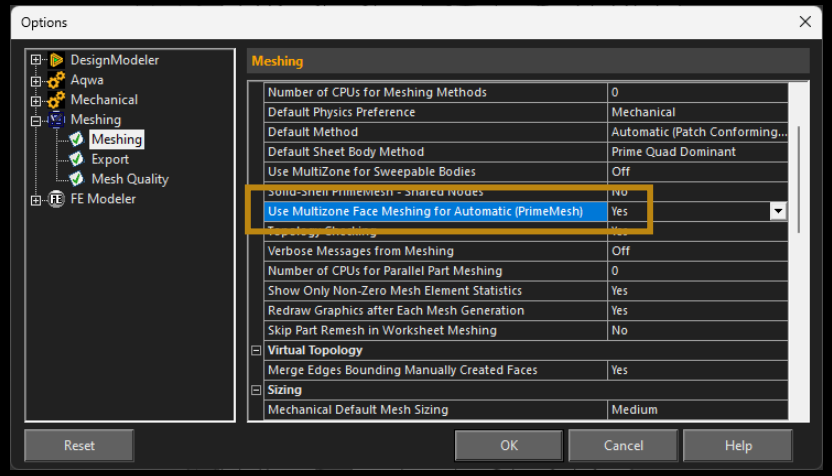
## Welds and Shell Meshing

DRD

# Prime Method: Mapped Meshing Enhancements

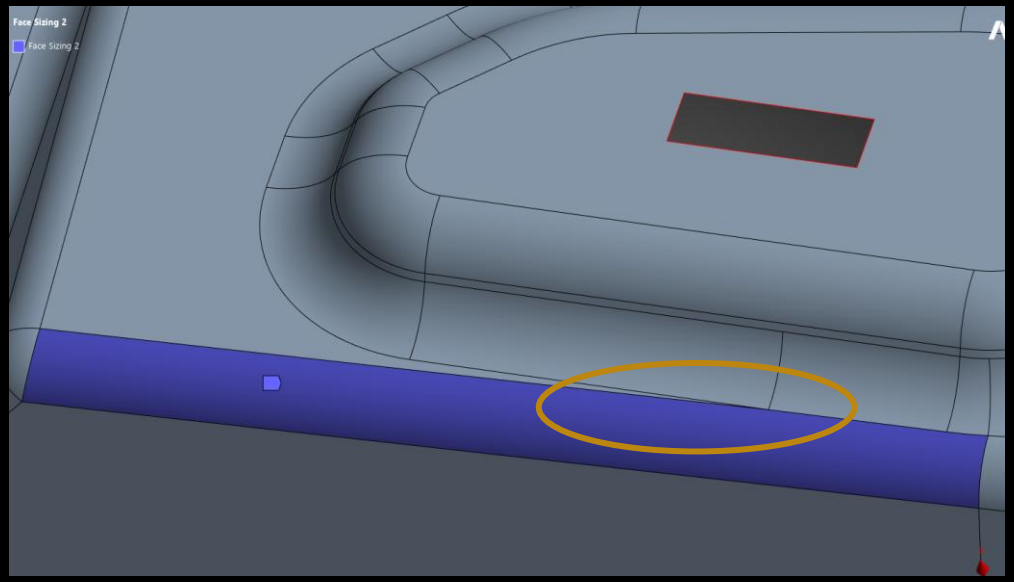
- Use of MultiZone 2D technology for mapped meshing
- Allows support for range of map meshing controls for Prime Method
  - 2-loop face meshing (O-Grid patterns) with number of internal divisions control
  - Semi-structured transitions
  - Circle/Semi-Circle/Quarter-Circle patterns



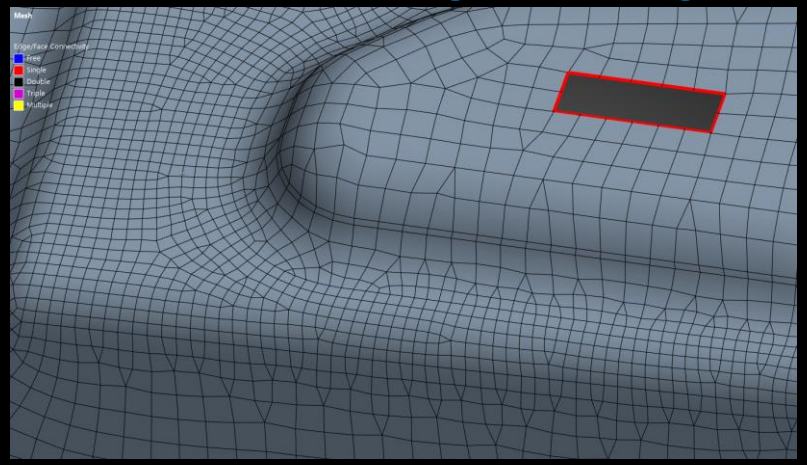
# Prime Mesh Sizing Improvements

- Compute Size field for curvature/soft etc before Repair Topology operations
  - E.g. In previous versions, sizing was applied after face merging happened and local sizing would then apply to larger merged surfaces

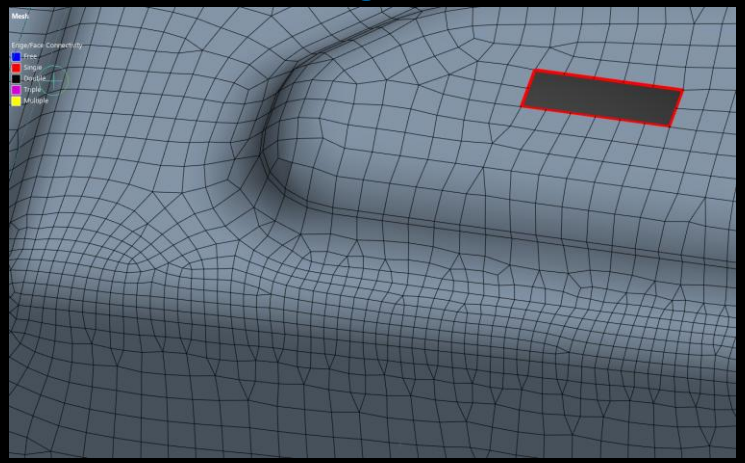



*Face Sizing control applied on a face where Repair Topology will cause merging due to sharp angle during Mesh generation*

*Previous Version Behaviour – sizing extended to neighbours*

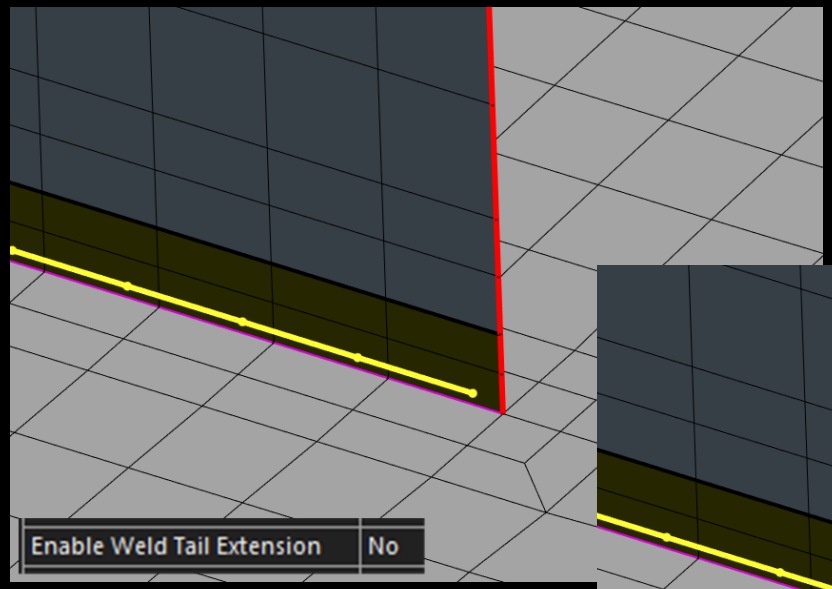


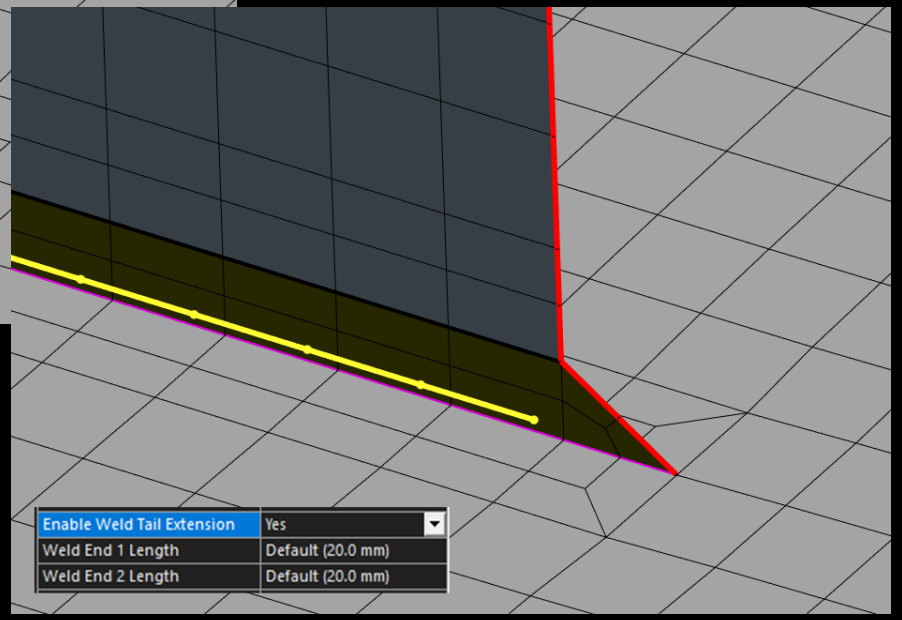
*2026R1 Behaviour – sizing remains localized*

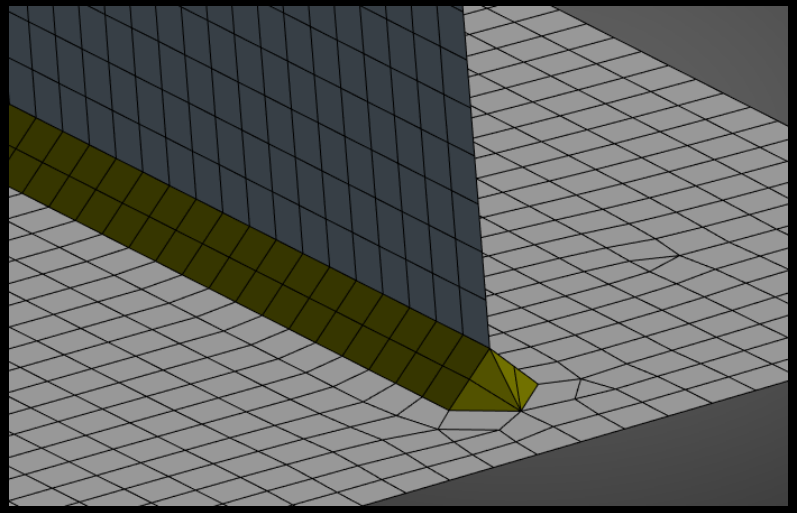


# Weld Tail Extension

- Weld tail extension now supported



# Ansys Mechanical

## Meshing Performance

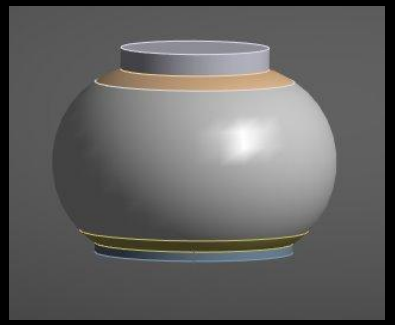
DRD

# Mesh Disconnected Body Groups in Parallel

- Parallel Part meshing has been in Mechanical for many years and allows fast meshing of disconnected (non-shared) parts across threads/cores
  - Highly beneficial for multibody parts with MultiZone or mixed methods
- Within a multi-body part with share topology, bodies sent to the mesher together will be
  - Sorted into clusters based on connectivity
  - Disconnected clusters will be sent to separate threads for meshing
  - This will allow incremental meshing using body selection and Mesh Worksheet ordering to make use of multiple cores to complete meshing faster
  - This option will compute sizing separately on different body groups and meshing outcomes can be slightly different to previous default behavior
    - For this reason, in the first release, the user must actively enable this option in the Mesh Options menu by setting **Mesh Disconnected Body Groups in Parallel** to **Yes**

***Example Model***

- 989 Solder Balls
- Each has 5 connected bodies
- Connected to board at top/bottom with share topology
- Meshed with MultiZone



| | Time taken | Speed-up |
|---|---|---|
| Serial Code | 15min 46s | 1 |
| Parallel Body Meshing | 3min 33s | 4.44 |

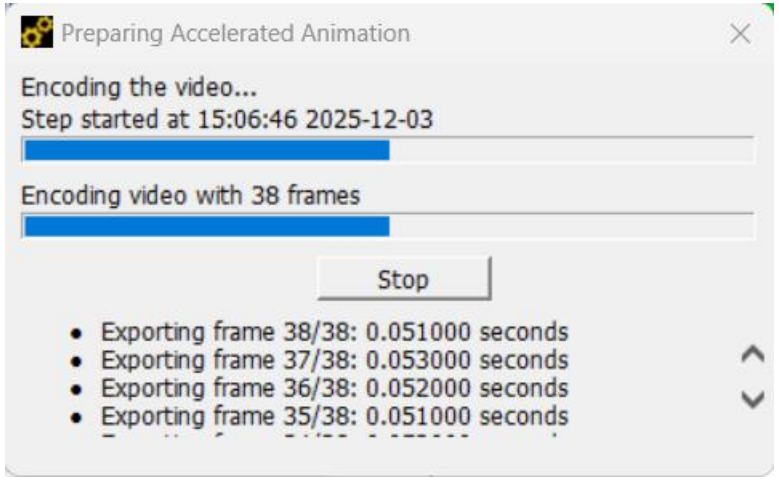
# Ansys Mechanical

General

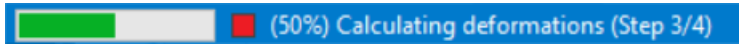
DRD

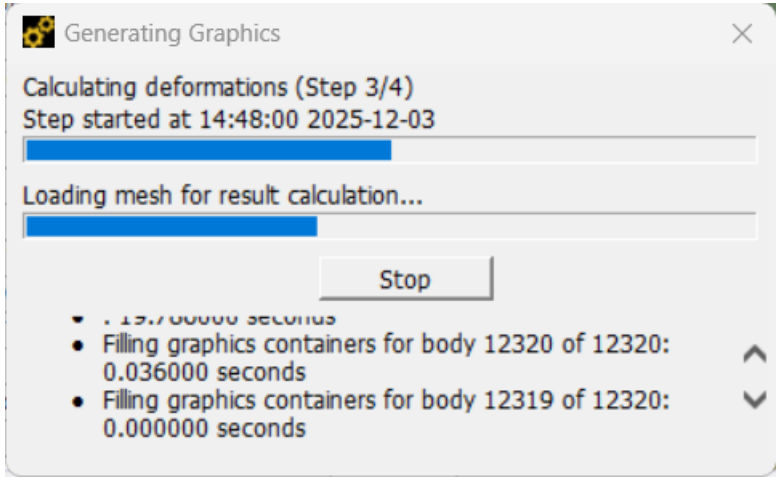
# Progress and Cancellation for Graphics Displays

- Certain graphics operations such as viewing the mesh, viewing a result, and starting or exporting an animation, sometimes require a considerable amount of time to process
- In 2023 R2, a beta feature was released that provides a progress bar, timestamped event log, and cancellation button for such long-running operations
- In 2026 R1, the beta feature was promoted and fully released, available through File > Options… > Mechanical > Graphics > Performance > Graphics Display Progress Bar







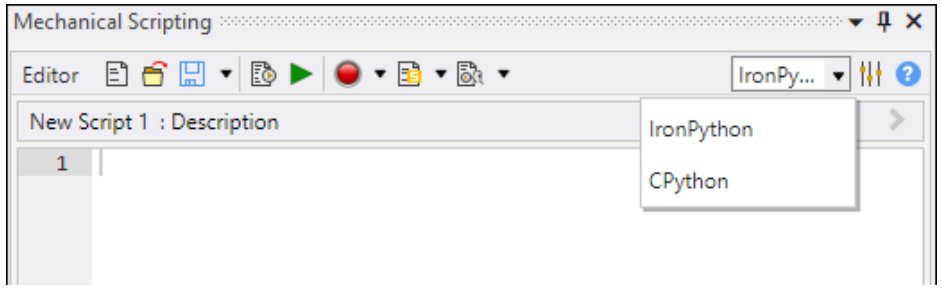



# Body Merge

- Multiple body merges allowed
- Results of previous body merge can be used in following body merge
- Body merges are always executed in the order it shown in the tree.

# Mechanical Scripting: CPython Support

- Supports CPython (Python 3.x) plus IronPython (Python 2.x)
- Select either CPython or IronPython as the Python engine in the Mechanical Scripting window, the Button Editor, Python Code objects, and Python Results objects




- Specify the Python engine for running a script when launching Mechanical from the command line.
- Set the default Python engine for new scripts, buttons, and Python objects, plus scripts run from external files.
  - Defaults to IronPython for backwards compatibility
- CPython allows for native import/use of modules like numpy, scipy, matplotlib, and any other standard python module

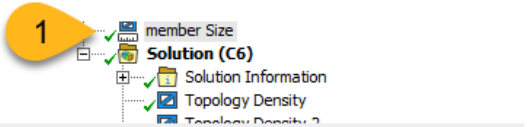
# Ansys Mechanical

## Structural Optimization

DRD

# Mixable Density – Rib Design

1




Details of "member Size"

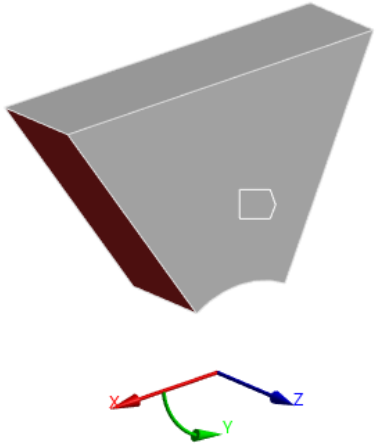
| | |
|---|---|
| **Scope** | |
| Scoping Method | Optimization Region |
| Optimization Region Selection | Optimization Region |
| **Definition** | |
| Type | Manufacturing Constraint |
| Subtype | Member Size |
| Suppressed | No |
| **Minimum Size Controls** | |
| Minimum | Manual |
| --Min Size | 2.e-003 m |
| **Maximum and Gap Size Controls** | |
| Measurement Type | In-Plane |
| -- Coordinate System | Global Coordinate System |
| -- Plane | XY Plane |
| Maximum | Manual |
| --Max Size | 3.e-003 m |
| Gap Size | Manual |
| --Value | 3.e-003 m |

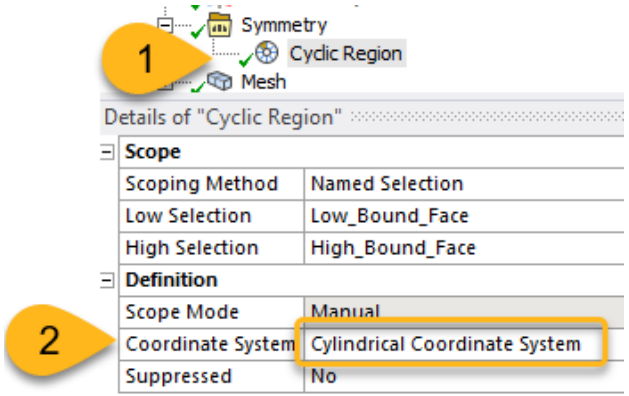
2

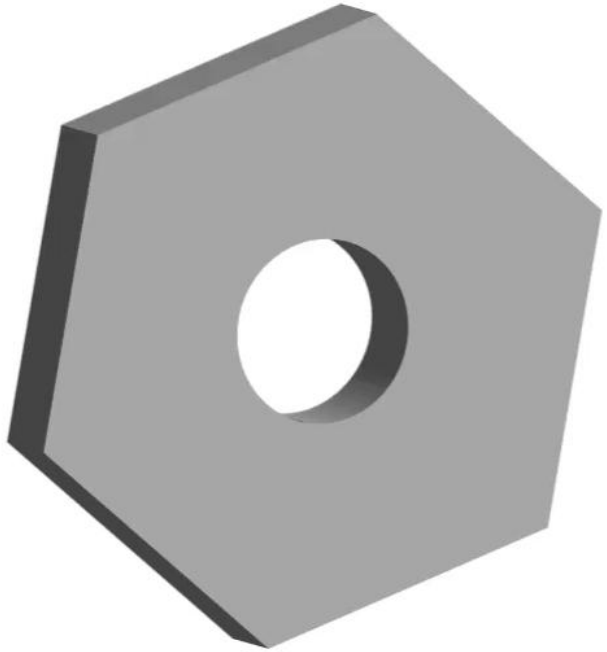
Isotropic

In-Plane

# Cyclic Model Support / Static Analysis



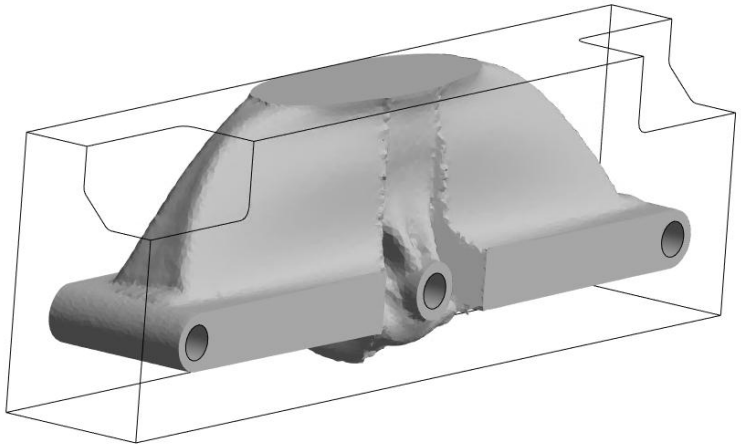



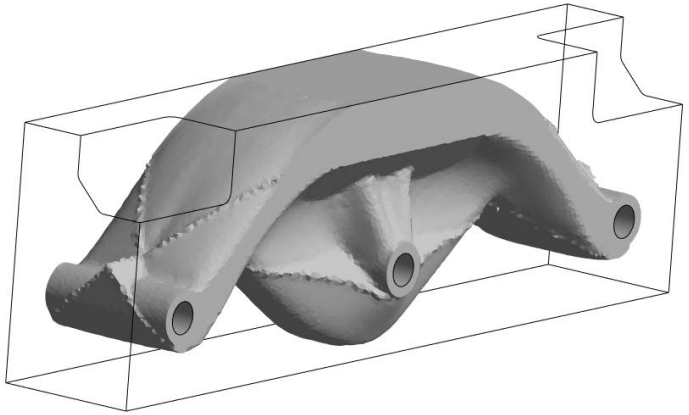



Level Set

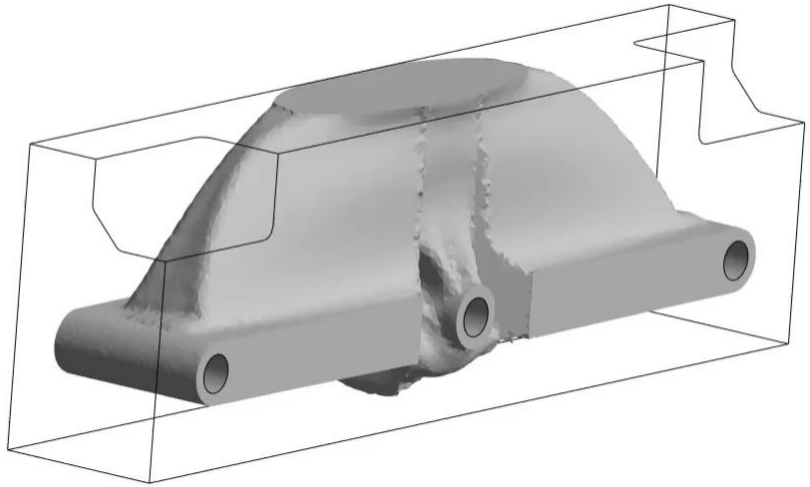
Mixable Density

# 4-axis Milling

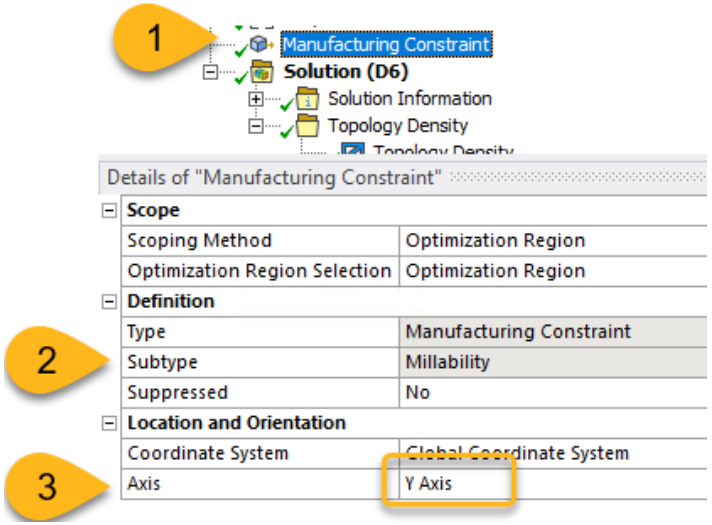




X-Axis



Y-Axis



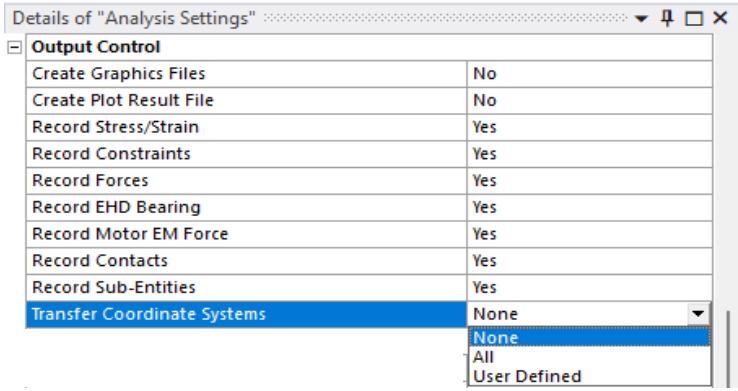
# Ansys Mechanical

Motion

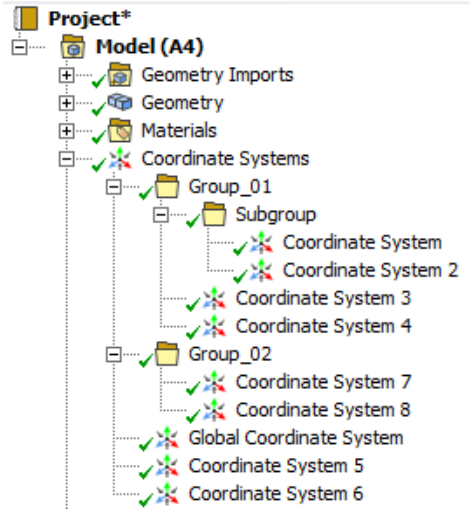
DRD

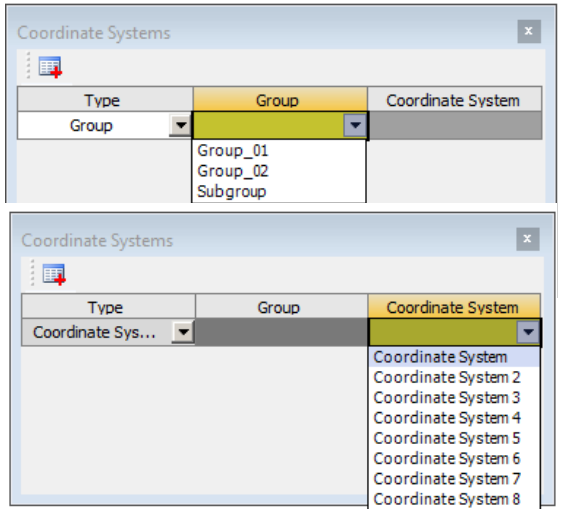
# Transfer Coordinate Systems Option

- **“Transfer Coordinate Systems”** has been added under Analysis Settings > Output Control



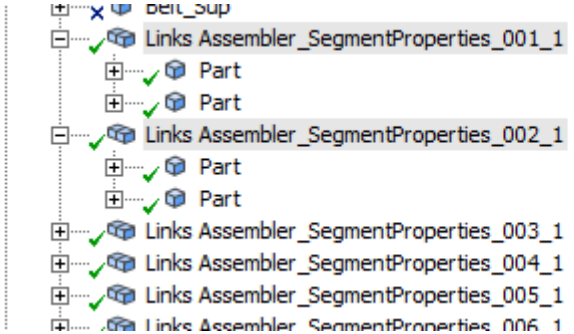

- Users can choose how coordinate systems are transferred to postprocessor.
  - The new property consists of three options:
    - None (Default): No coordinate system are transferred.
    - All: All are transferred.
    - User Defined: Selected coordinate systems are transferred. It allows customers to select either Groups or each coordinate systems

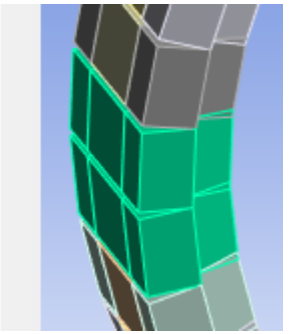


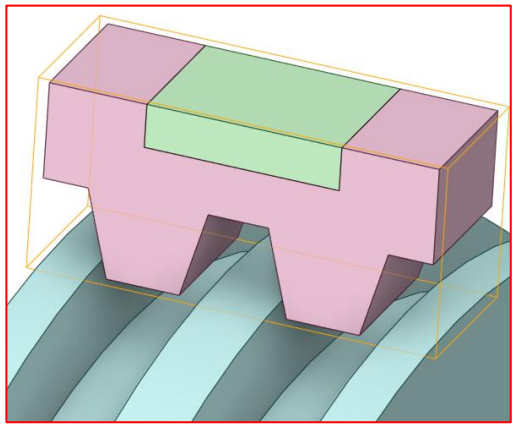

# Improvements in Links toolkit

- Segment supports multi-body parts
- Engage options
  - Off / Pin / Center option is available.

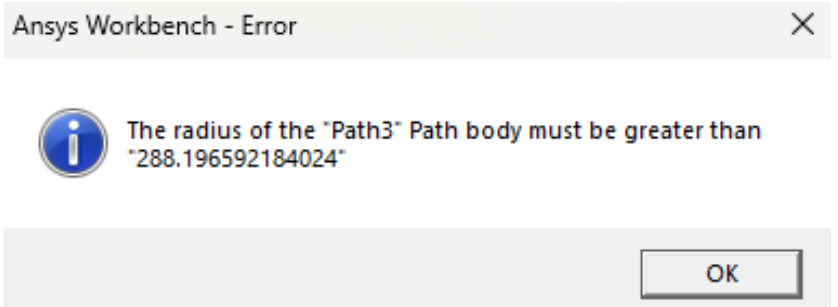


- Appropriate warning messages has been added
  - Links does not support cases where all path have the clockwise option.
  - If assemble segment fails due to specification violation, a guide message is displayed.

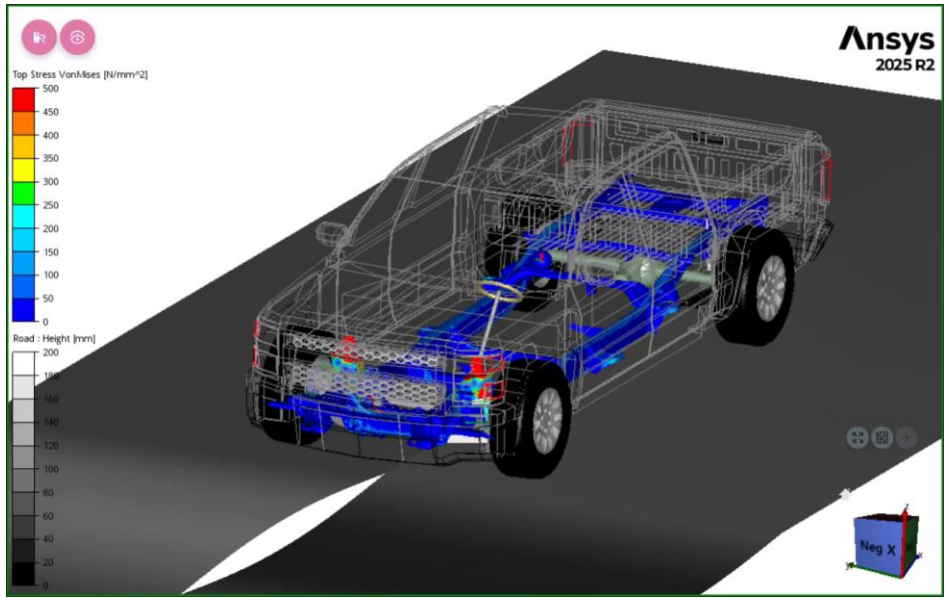


- Exclude all dummy contacts in contact property table
  - A dummy contact is internally generated before cloning and are now removed from the table.



# Loading animation data - postprocessor

- When animating simulation results with a large number of degrees of freedom (DOFs), the following issues often occur:
  - Excessive physical memory usage
  - Long loading times
  - Inability to record high-frame-rate animations
- To address these issues, the **Suppress Deformation** option allows FE Bodies to be treated as rigid bodies during animation, significantly reducing resource consumption.

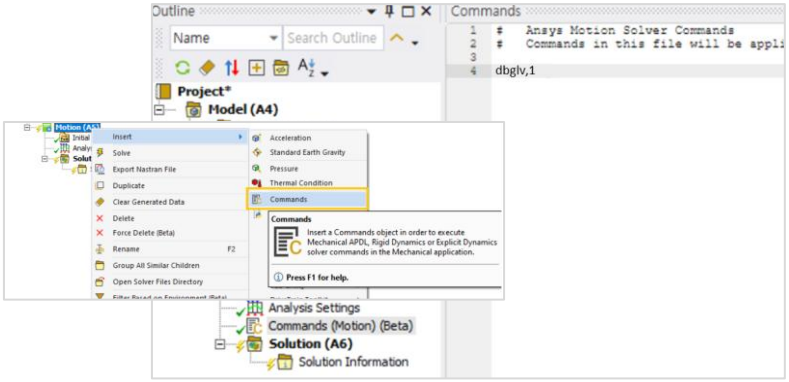


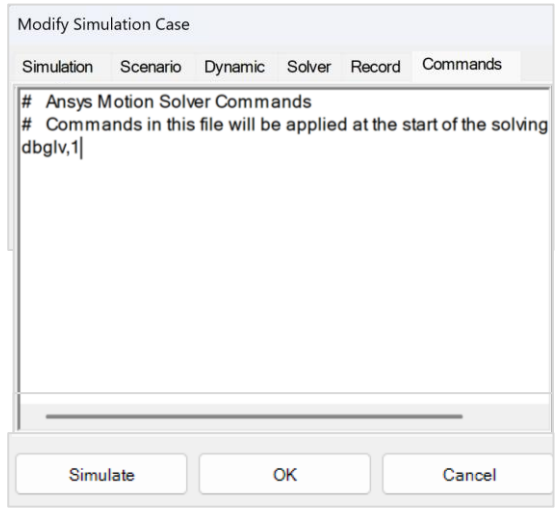

Vehicle Model – 7M nodes

| Version | Suppress deformation | Loading Perform (vs 252) | Memory |
|---|---|---|---|
| 252 | N/A | 150s | > 20G |
| 261 | Off | 115s (x 1.3) | 18.6G |
| | On | 2.44s (x 62) | 3.8G |

# Solver Command with input field

- **Solver Commands** are expert-level settings to customize solver behavior which is not exposed in UI. It used for internal testing, customer support, and advanced use cases.
  - See more details - Chapter 14: Solver Commands
- Examples
  - dbglv,1 → Enables debug mode with level 1
  - cstcortp,0 → Skips velocity/acceleration constraint computation for faster analysis
- Availability by Version
  - 2024 R2: solver input file(DFS) editing only
  - 2025 R2: Mechanical Motion pre-solver command
  - 2026 R1: Available as a beta feature in Mechanical Motion and STD Preprocessor

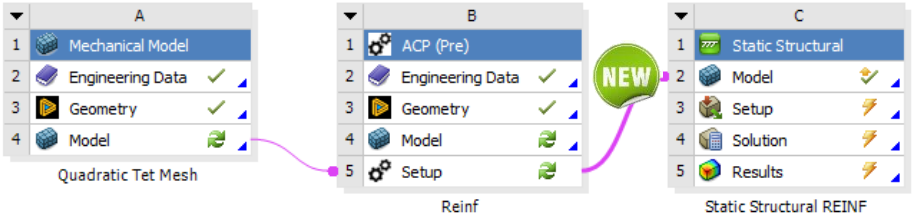


# Ansys Composite PrePost

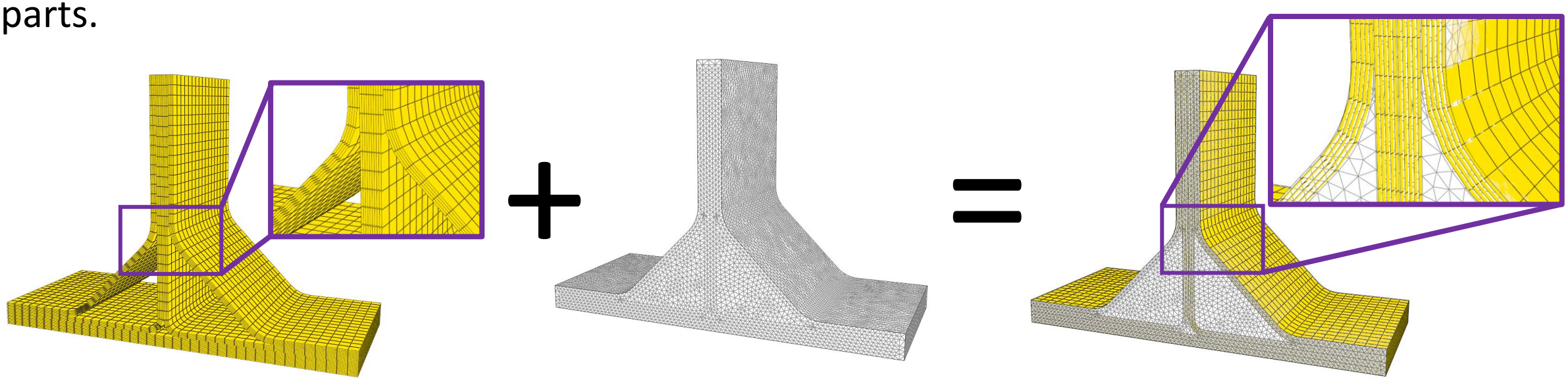
DRD

# Solid Modeling - Reinforcing Workflow




2026 R1 comes with a new solid model workflow which allows to model plies in 3D layered composites as reinforcements. This minimizes the dependency between the solid mesh and the laminate and allows to use any type of solid elements. See Imported Solid Model and Example Analyses for more information.

Typical use cases are fan blades (turbo machinery), PCBs, and complex 3D composite parts.

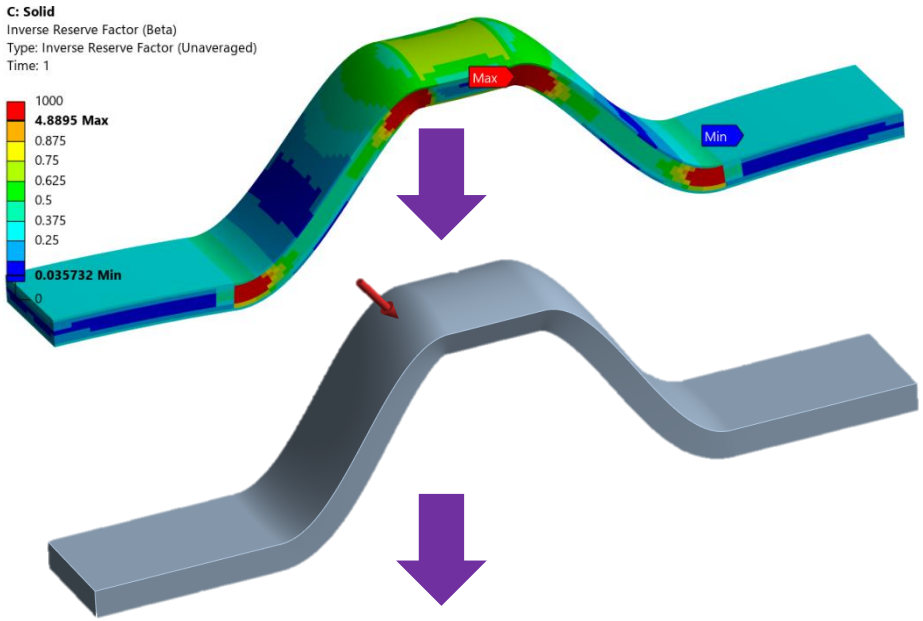


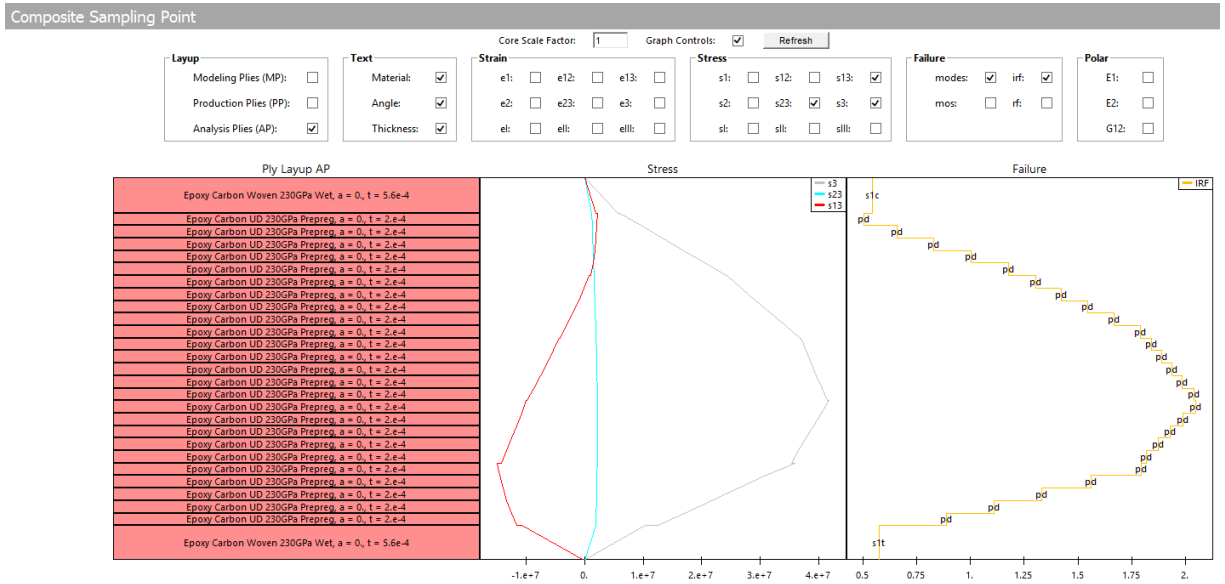
*3D reinforcing plies* + *Solid mesh (tetra, quad …)* = *Combined meshes*

# Sampling Point for Solid Models

The Composite Sampling Point Tool in Mechanical can now also be scoped to an ACP solid model.

The Sampling Point Tool provides access to the results from the bottom of the laminate to the top. The visualization of the through-the-thickness distribution of the results (stacking sequence, strains, stresses and failures) is important to understand the behavior of the laminate and to optimize it.



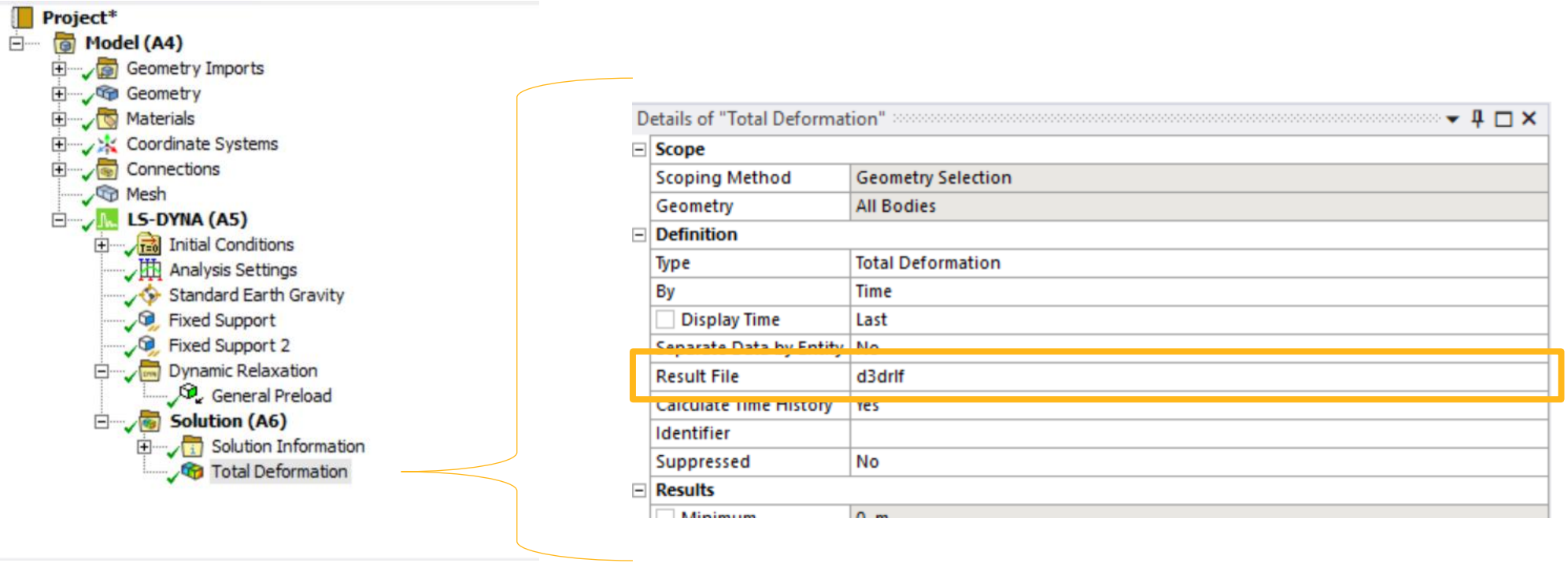

*Distribution of S3, S13 and S23 through the laminate*

# LS-DYNA

DRD

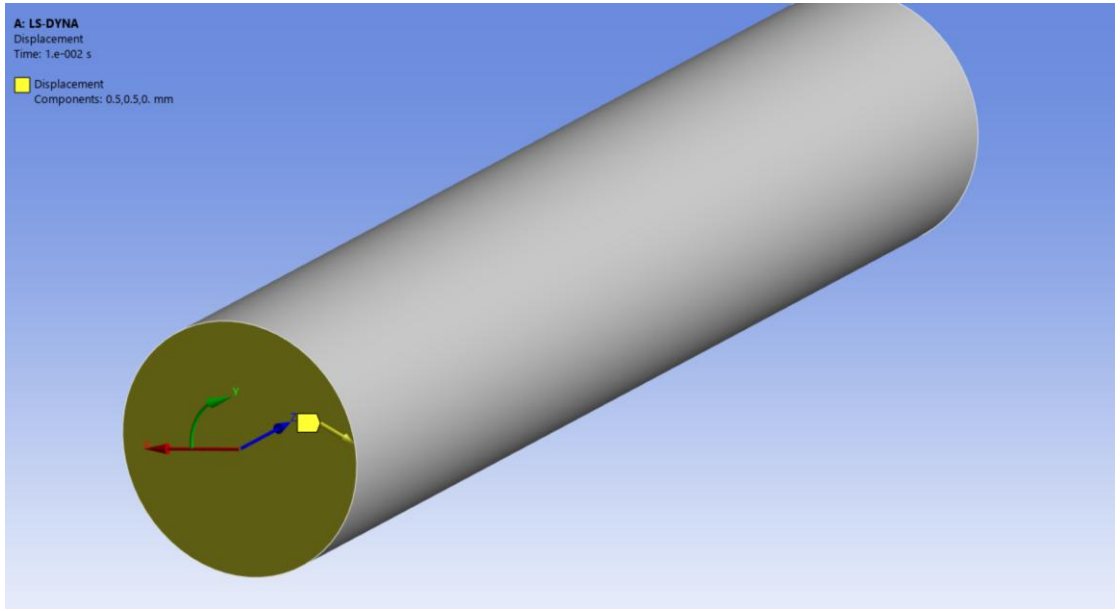
# Dynamic Relaxation Enhancement

- If a model contains *Dynamic Relaxation* the **.d3drlf* file is created automatically to enable postprocessing of the Dynamic Relaxation in the Mechanical Interface.



# Cylindrical Coordinate System Support

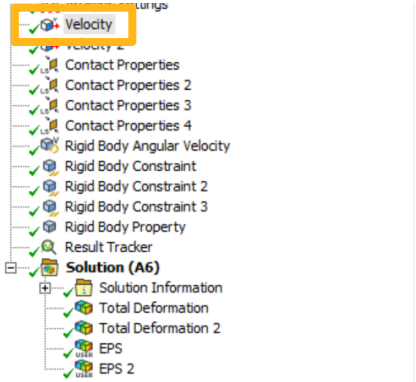
- Add the ability to define a displacement boundary condition in a cylindrical coordinate system in Mechanical Interface
- As the shipped solver version (R16.1) does not support cylindrical coordinate systems, for each node in the scoping a local displacement boundary condition is written (similar to LS-PrePost)




```
*DEFINE_VECTOR
$       ID        xt        yt        zt        xh        yh        zh       cid
         1         0         0         0 -0.008521  1.83E-06         0         0
*BOUNDARY_PRESCRIBED_MOTION_NODE
$      sid       dof       vad      lcid        sf       vid     death     birth
      1863         4         2         2         1         1         0         0
*DEFINE_VECTOR
$       ID        xt        yt        zt        xh        yh        zh       cid
         2         0         0         0 -0.007777  0.001475         0         0
*BOUNDARY_PRESCRIBED_MOTION_NODE
$      sid       dof       vad      lcid        sf       vid     death     birth
      1864         4         2         2         1         2         0         0
*DEFINE_VECTOR
$       ID        xt        yt        zt        xh        yh        zh       cid
         3         0         0         0 -0.006592 0.0033039         0         0
```

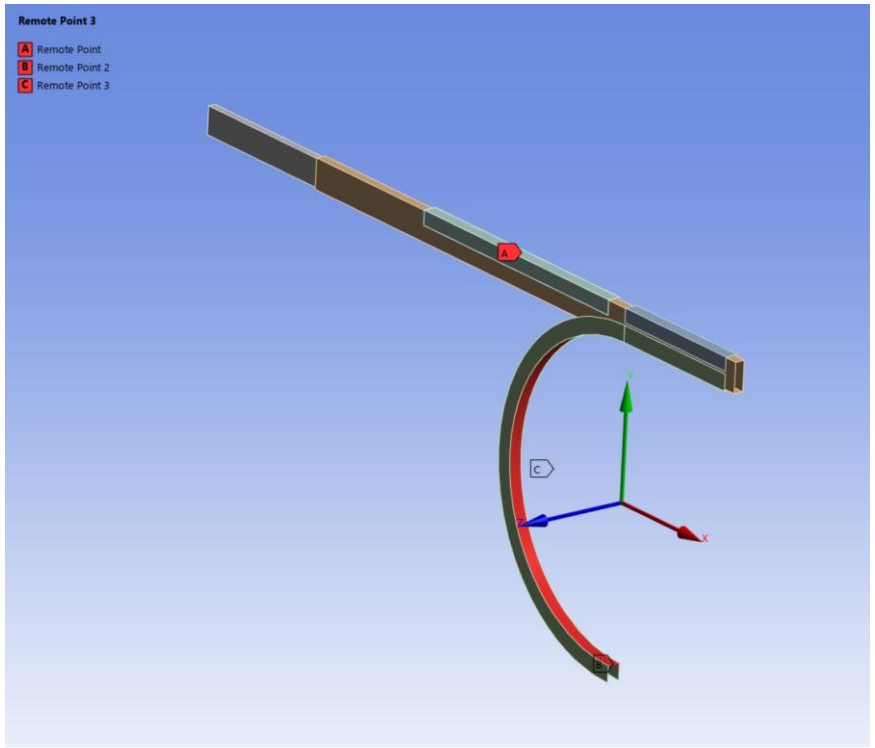
# Remote Point Scoping for Velocity

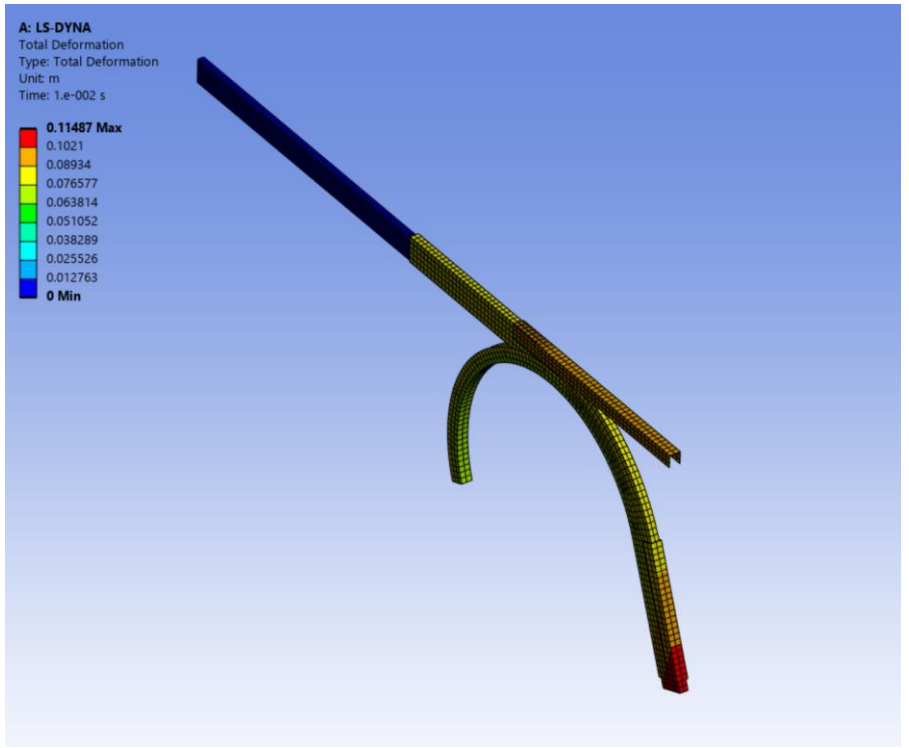
- The *Velocity* boundary condition can now be scoped to *Remote Point*




Details of "Velocity"

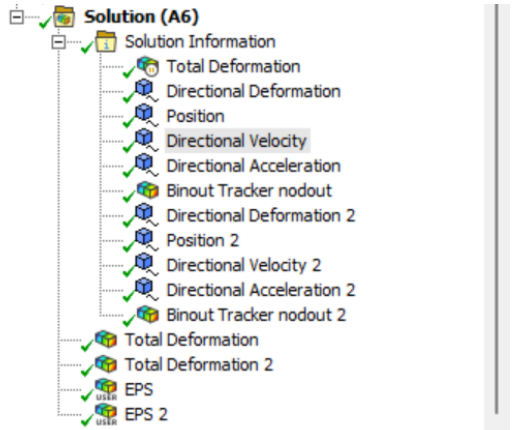
| Scope | |
|---|---|
| Scoping Method | Remote Point |
| Remote Points | Remote Point |
| **Definition** | |
| Type | Velocity |
| Define By | Components |
| Coordinate System | Global Coordinate System |
| X Component | Free |
| Y Component | Free |
| Z Component | Tabular Data |
| Case Number | 1 |
| Suppressed | No |
| Dynamic Relaxation Behavior | Normal Phase Only |



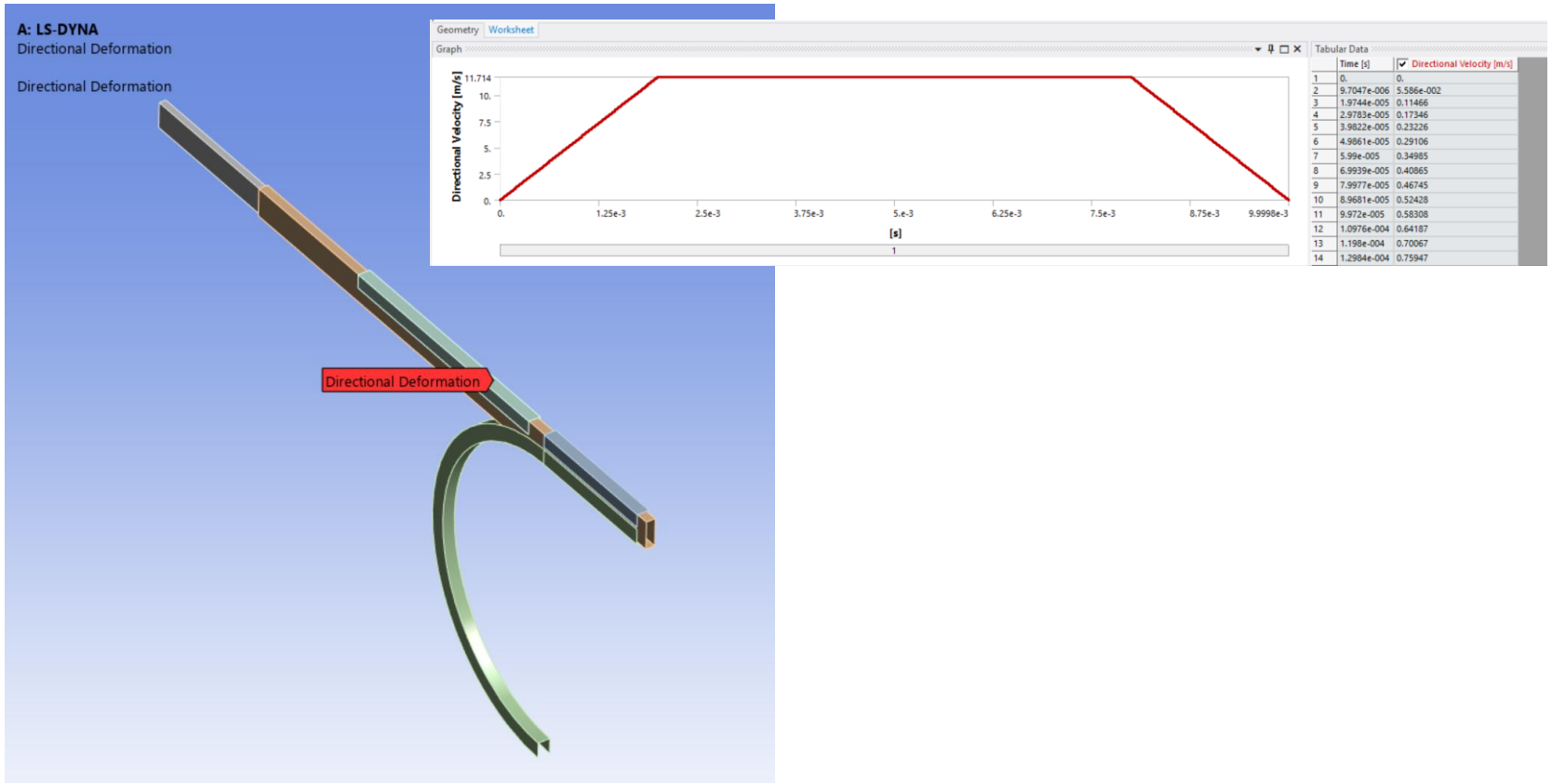
# Remote Point Scoping for Result Trackers

- Scoping for *Result Trackers* is now enabled for *Remote Points*



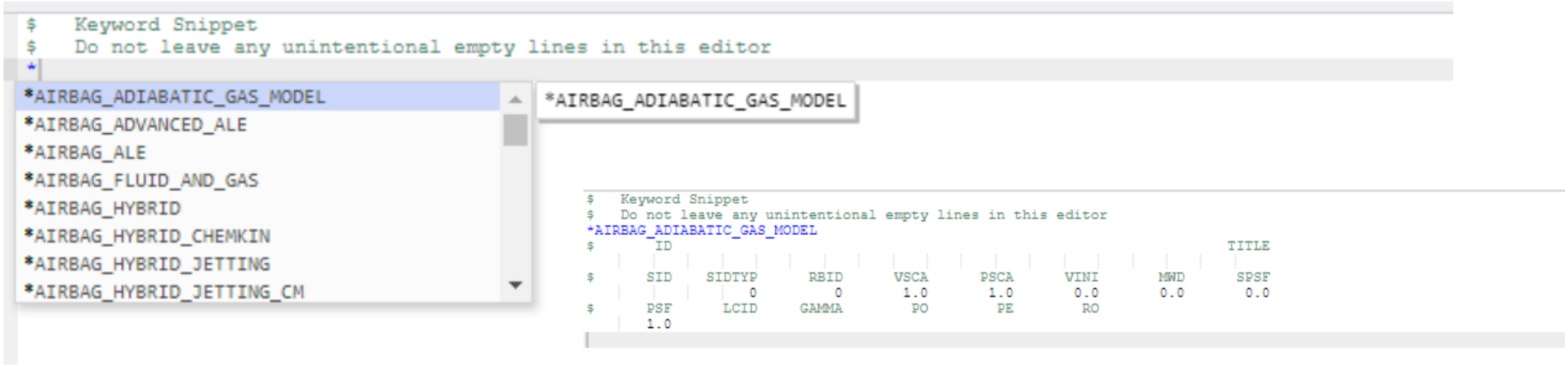

Details of "Directional Velocity"

| Definition | |
|---|---|
| Location Method | Remote Points |
| Remote Points | Remote Point |
| Type | Directional Velocity |
| Orientation | Z Axis |
| Suppressed | No |
| Case Number | 1 |
| **Results** | |
| Minimum | 0. m/s |
| Maximum | 11.714 m/s |
| **Filter** | |
| Type | None |



# Command Snippet Auto Completion

- All Keywords available in the *Keyword Manager* alongside Material Keywords benefit from auto completion within command snippets in Mechanical Interface
- Keyword Cards & comment lines with parameter names are auto populated



# S-ALE/ALE Improvements

The LS-DYNA ALE/FSI solver is widely used in studying structures under blast loading. In general, the ALE mesh is unstructured to accommodate complex geometries. However, for simple rectilinear geometries a structured mesh can be used. It offers significant memory reduction and performance enhancements.

The S-ALE solver is dedicated to solve the subset of ALE problems where a structured mesh is appropriate

Ansys LS-DYNA 2025R2 Mechanical introduces a new mesh workflow enabling creation and visualization of the structured mesh including advanced solver options

The solver input generated by Ansys LS-DYNA 2025R2 uses the latest S-ALE Keywords.

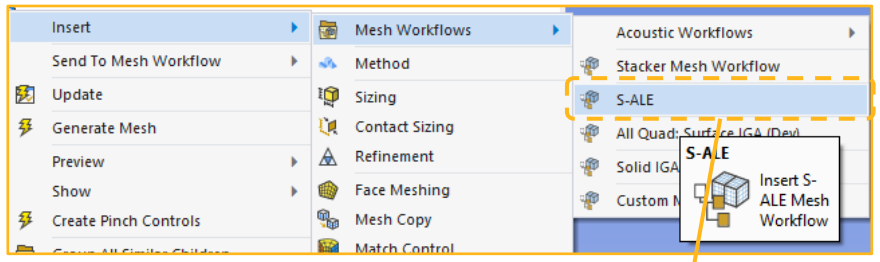
With 2026R1 release many aspects of the S-ALE has been improved.

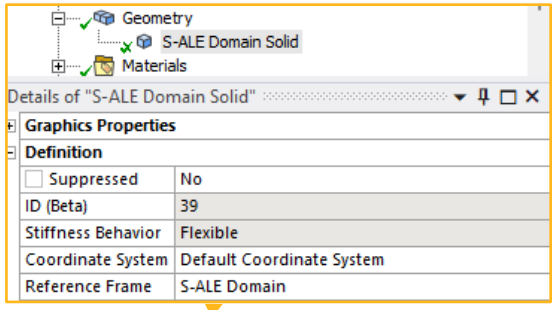
# S-ALE Specific Mesh Workflow (added in 2025R2)

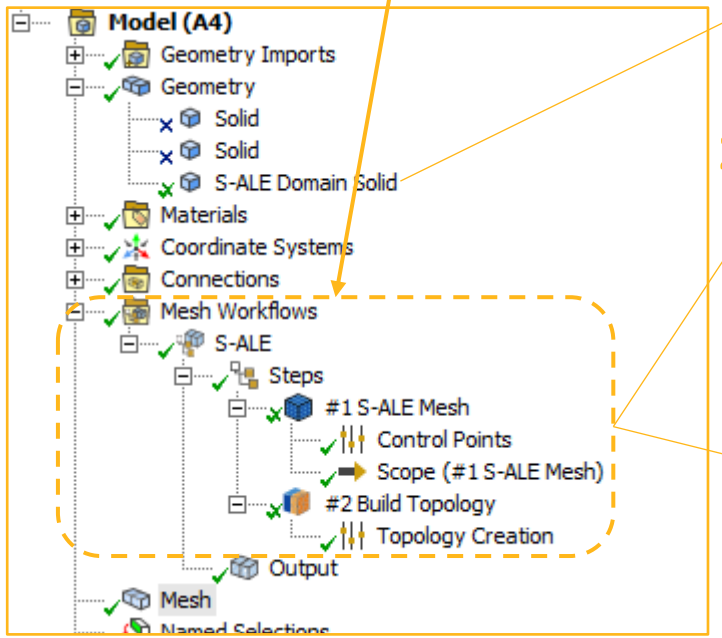
**Avail. in 2025R2**

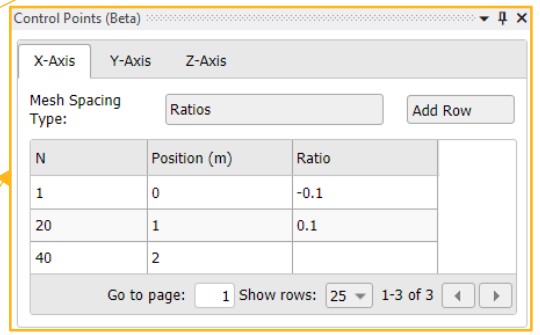
- Easy to use setup for 2D & 3D
  - Insert S-ALE Mesh Workflow
  - Specify Control Points
  - Generate Mesh workflow

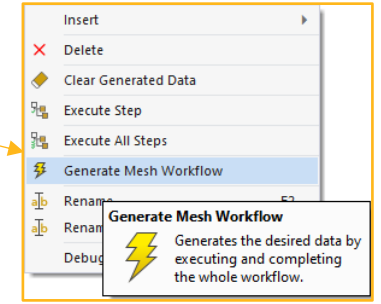
- Default or optional operations & controls
  - Default operations:
    - S-ALE Mesh
      - Controls: Control Points, Checkpoint, Outcome Scope
    - Build Topology
      - Controls: Topology Creation with scoping set to the outcome of the S-ALE Mesh operation, Checkpoint





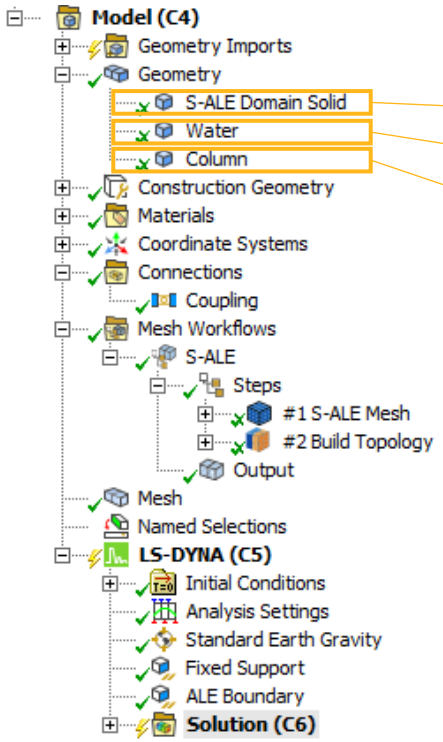


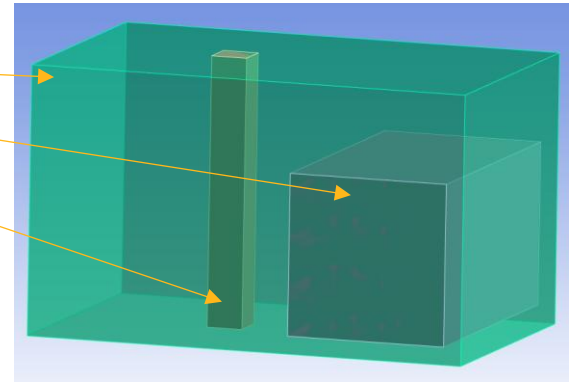
Ansys part of SYNOPSYS

# S-ALE Specific Mesh Workflow – Example

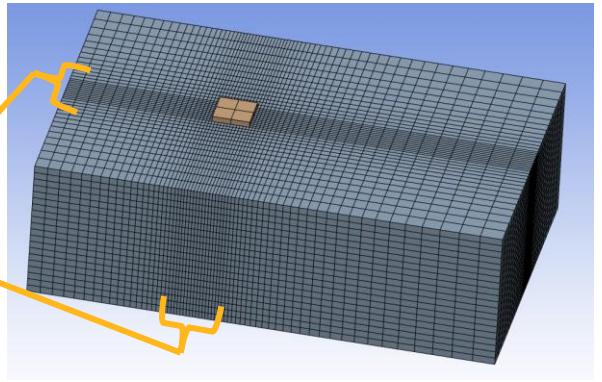
**Avail. in 2025R2**

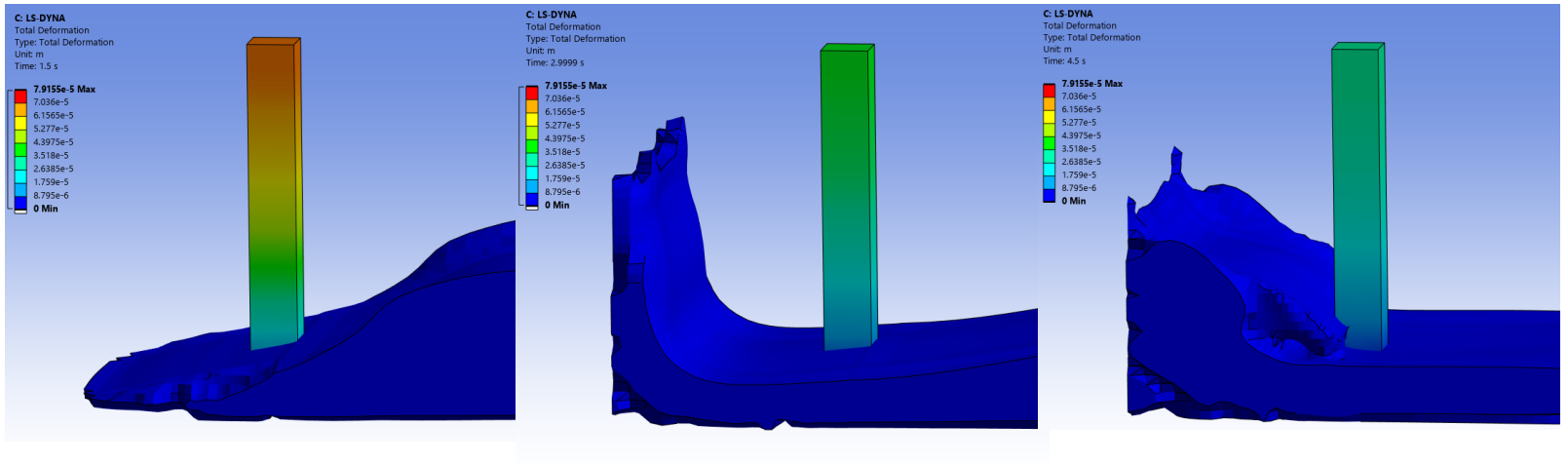
- Mesh biasing with *Control Points* used to refine mesh around structure



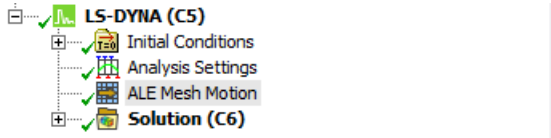
Finer mesh around the structure





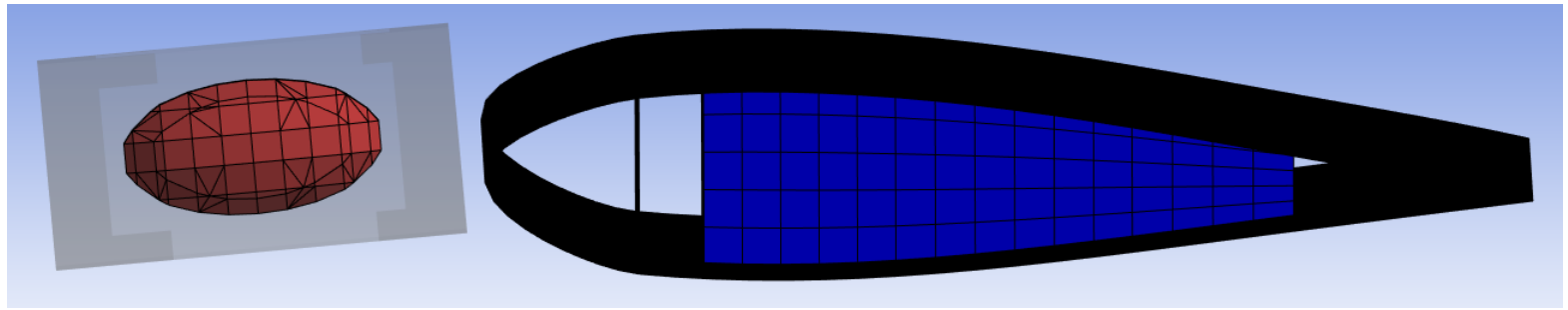
# S-ALE Mesh Motion

- *ALE Mesh Motion* object can be added in an LS-DYNA Analysis System to apply motion to an underlying mesh of bodies that have an *S-ALE Domain* Reference frame



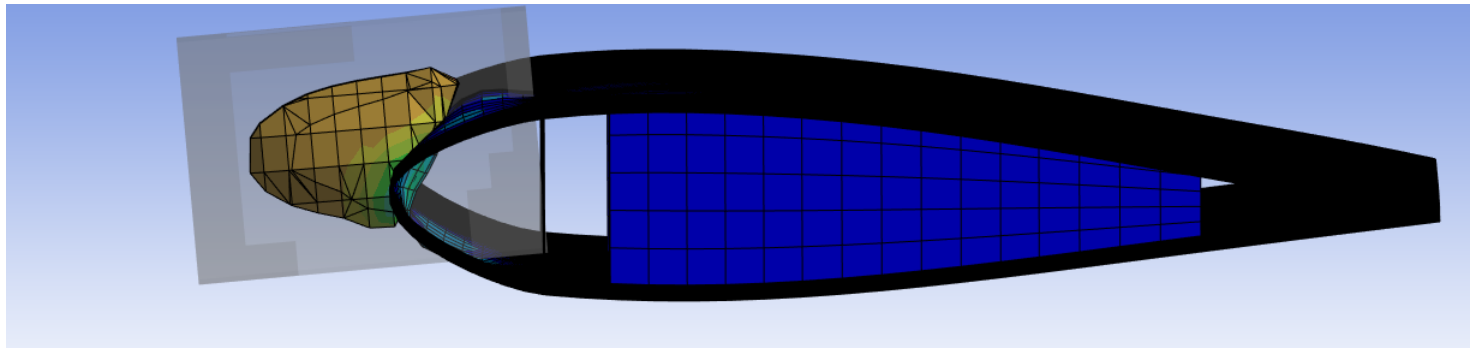

Details of "ALE Mesh Motion"

| | |
|---|---|
| **ALE Mesh Scope** | |
| Scoping Method | Geometry Selection |
| Geometry | 1 Body |
| **Definition** | |
| Mesh Motion Type | Follow Center of Mass |
| Expansion Limit Factor | 1.5 |
| **ALE Scope** | |
| Scoping Method | Geometry Selection |
| Geometry | 1 Body |



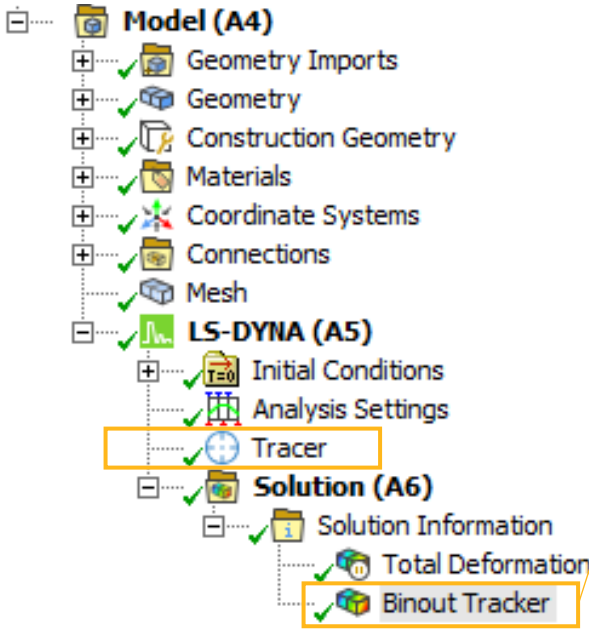
Details of "ALE Mesh Motion"

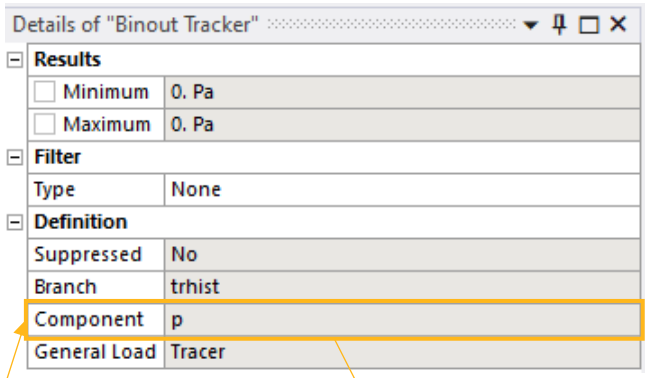
| | |
|---|---|
| **ALE Mesh Scope** | |
| Scoping Method | Geometry Selection |
| Geometry | 1 Body |
| **Definition** | |
| Mesh Motion Type | Cover Lagrange |
| Padding Factor | 4. |
| **Lagrange Scope** | |
| Scoping Method | Geometry Selection |
| Geometry | 1 Body |



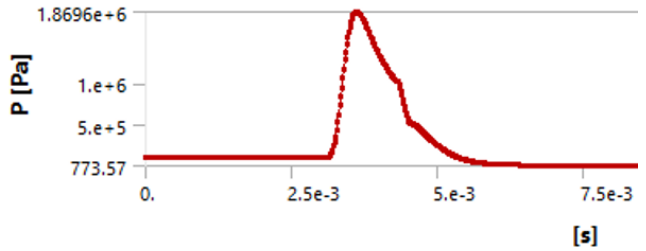
# Pressure Result for ALE Tracer

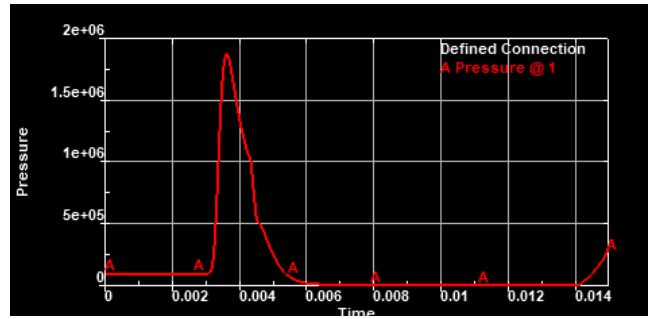
- *Tracer* object added in 25R2 with all solver generated components available using the *Binout Tracker* {x, y, z, vx, vy, vz, sx, sy, sz, sxy, syz, szx, efp, rho} enables now the calculation of *Pressure* in 2D & 3D

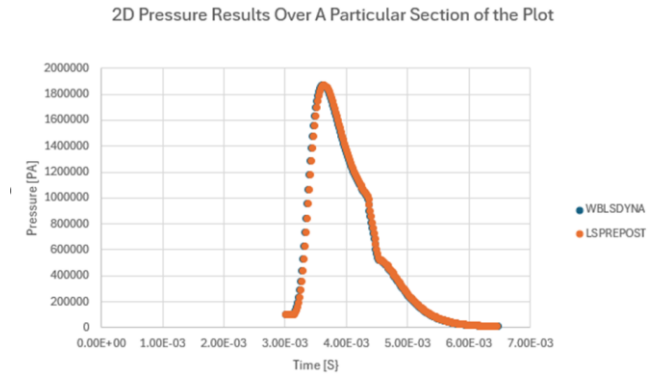



$$P = -\frac{\sigma_{xx} + \sigma_{yy} + \sigma_{zz}}{3}$$



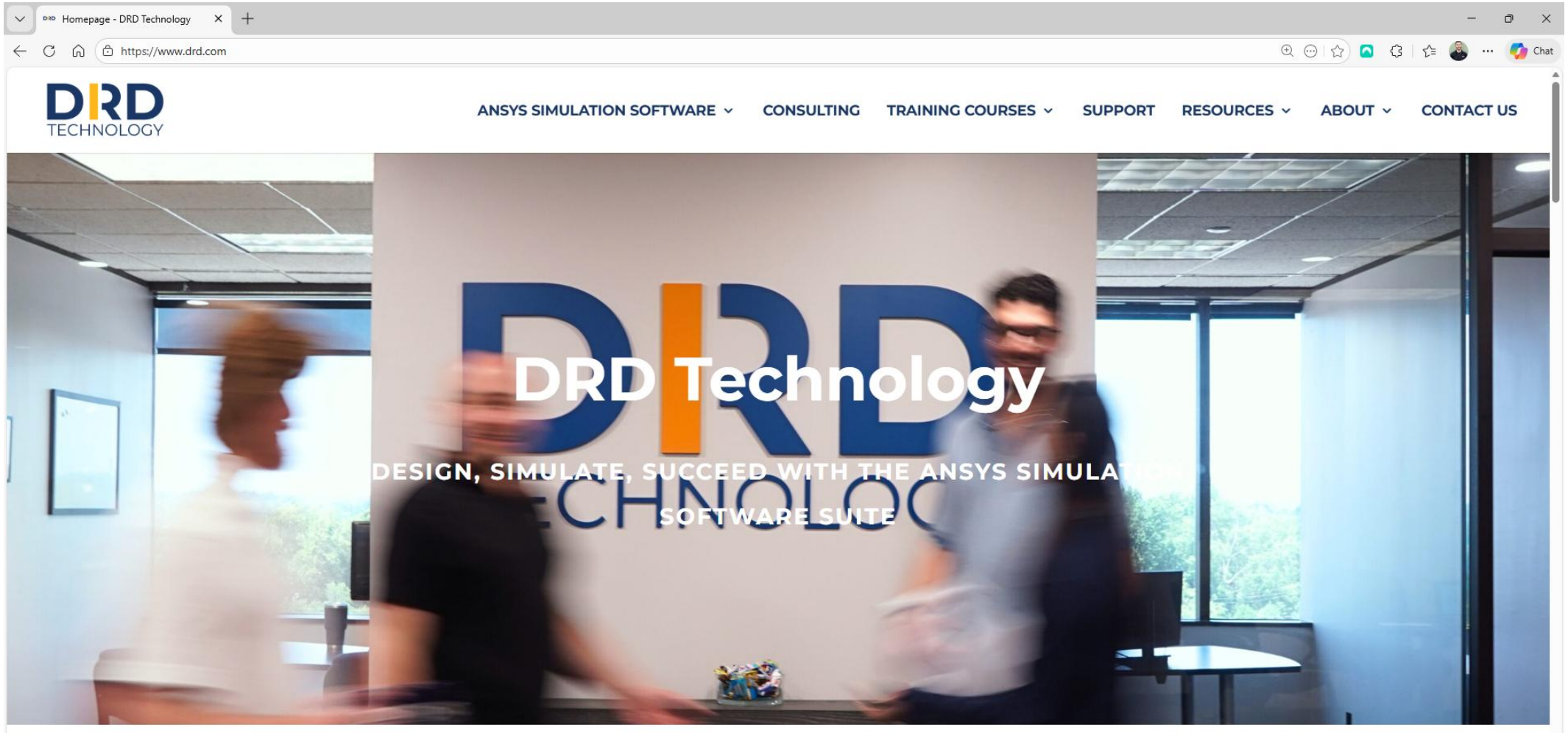



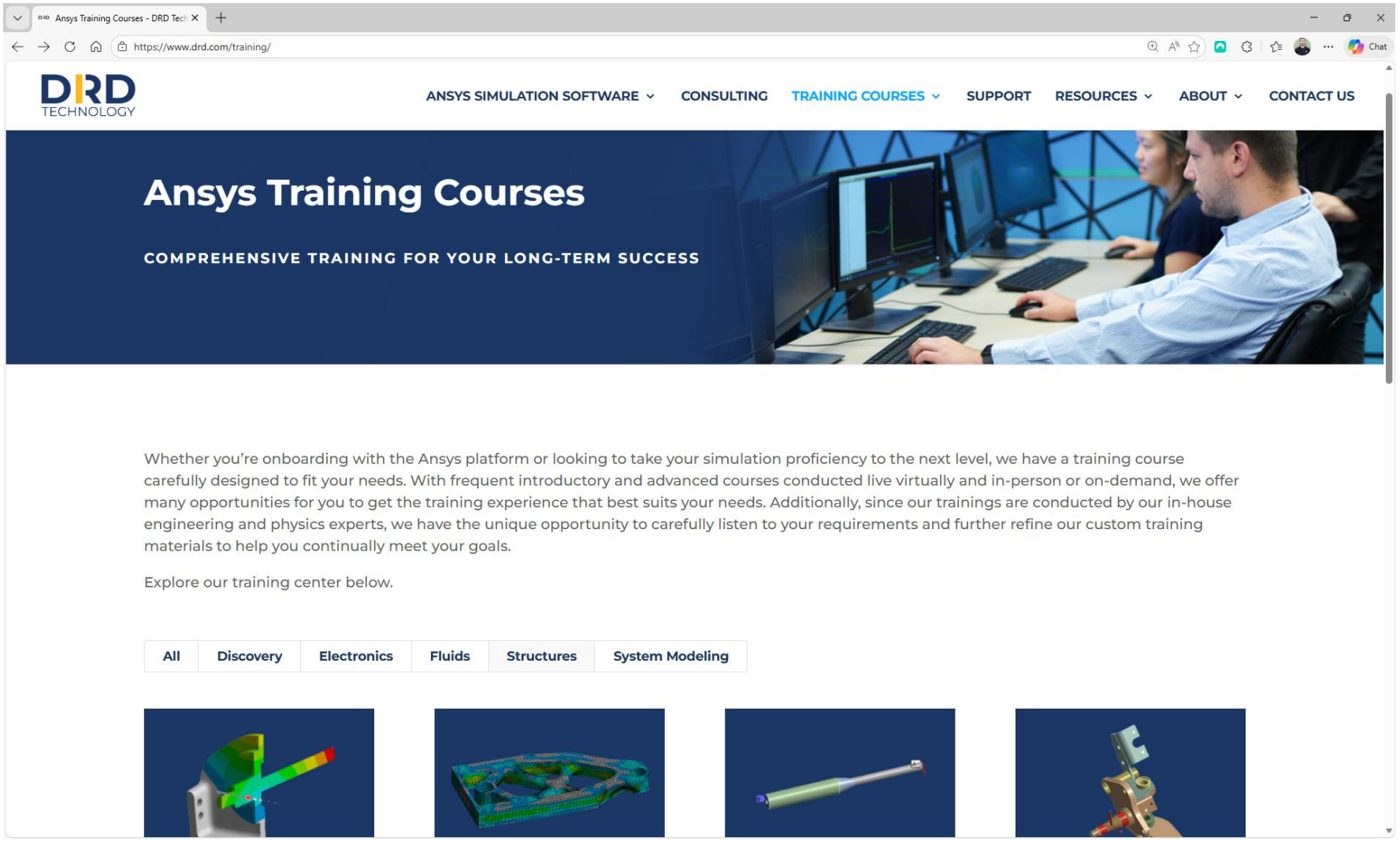
# Ansys Training Content

DRD

# Where to get Ansys Discovery Training Content

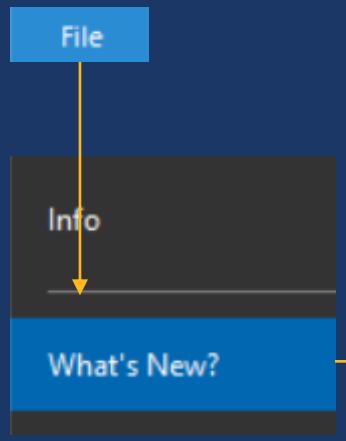


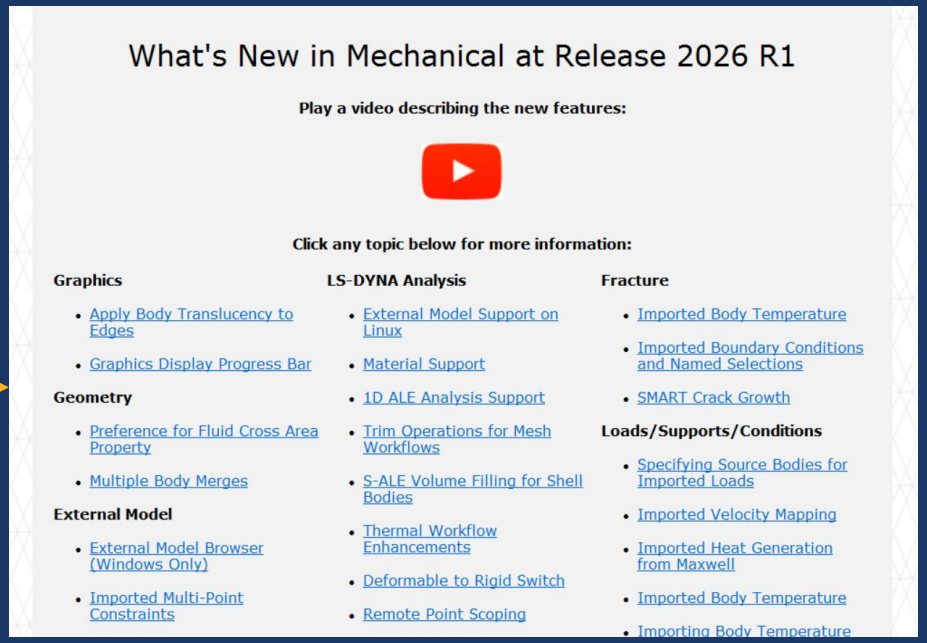
# DRD On-Demand Training Content



# Thank you for your attention!

## Any Questions?



What's New in Mechanical at Release 2026 R1

**Play a video describing the new features:**

**Click any topic below for more information:**

**Graphics**

- Apply Body Translucency to Edges
- Graphics Display Progress Bar

**Geometry**

- Preference for Fluid Cross Area Property
- Multiple Body Merges

**External Model**

- External Model Browser (Windows Only)
- Imported Multi-Point Constraints

**LS-DYNA Analysis**

- External Model Support on Linux
- Material Support
- 1D ALE Analysis Support
- Trim Operations for Mesh Workflows
- S-ALE Volume Filling for Shell Bodies
- Thermal Workflow Enhancements
- Deformable to Rigid Switch
- Remote Point Scoping

**Fracture**

- Imported Body Temperature
- Imported Boundary Conditions and Named Selections
- SMART Crack Growth

**Loads/Supports/Conditions**

- Specifying Source Bodies for Imported Loads
- Imported Velocity Mapping
- Imported Heat Generation from Maxwell
- Imported Body Temperature
- Importing Body Temperature