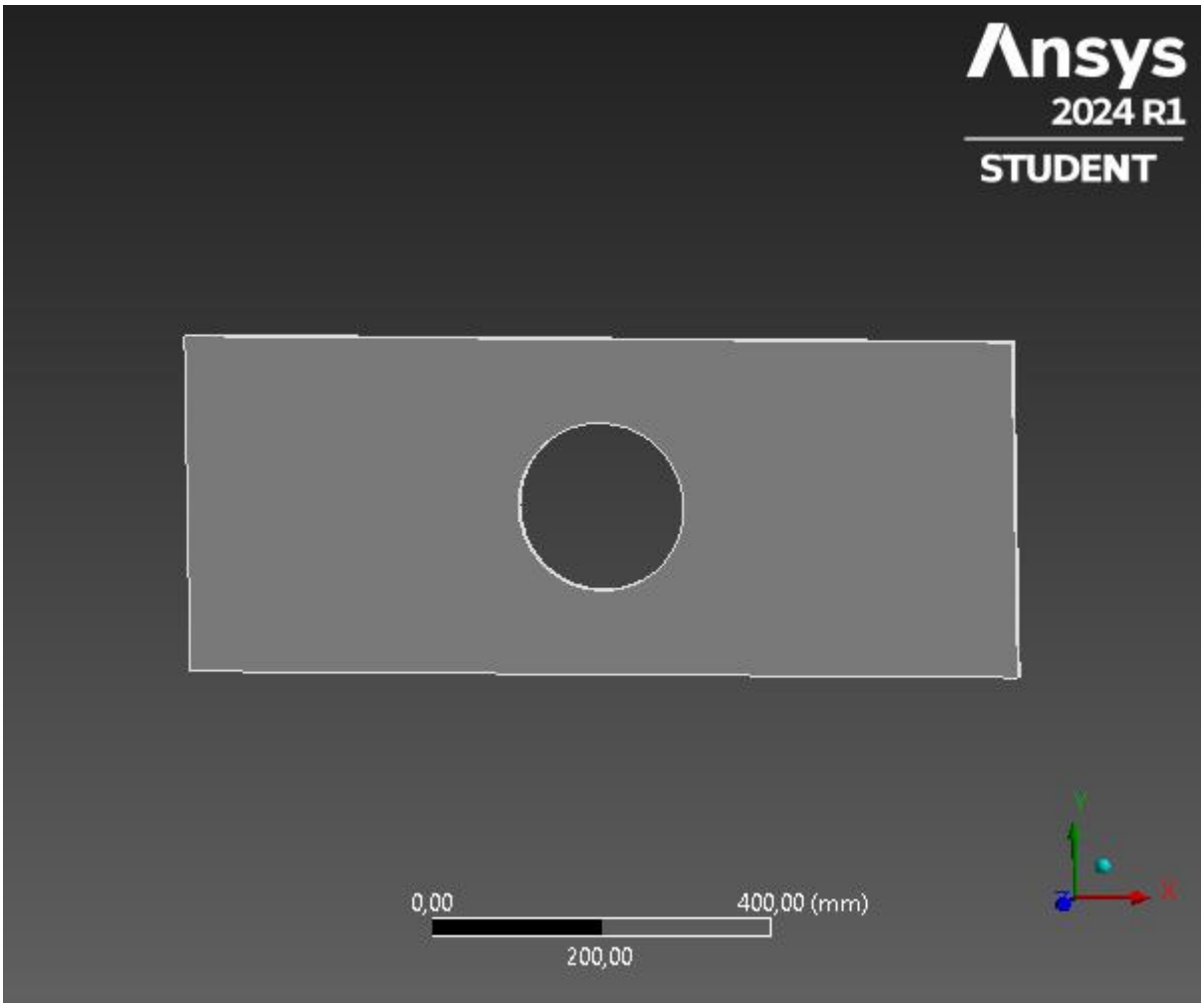
Project*

First Saved	Thursday, March 28, 2024
Last Saved	Thursday, March 28, 2024
Product Version	2024 R1
Save Project Before Solution	No
Save Project After Solution	No



Contents

Units

TABLE 1

Unit System	Metric (mm, kg, N, s, mV, mA) Degrees rad/s Celsius
Angle	Degrees
Rotational Velocity	rad/s
Temperature	Celsius

Model (A4)

TABLE 2
Model (A4) > Geometry Imports

Object Name	*Geometry Imports*
State	Solved

TABLE 3
Model (A4) > Geometry Imports > Geometry Import (A3)

Object Name	*Geometry Import (A3)*
State	Solved
Definition	
Source	C:\Users\mert_\AppData\Local\Temp\WB_Mert_12392_2\wbnew_files\dp0\SYS\DM\SYS.agdb
Type	DesignModeler
Basic Geometry Options	
Parameters	Independent
Parameter Key	
Advanced Geometry Options	

Compare Parts On Update	No
Analysis Type	3-D

Geometry

TABLE 4
Model (A4) > Geometry

Object Name	*Geometry*
State	Fully Defined
Definition	
Source	C:\Users\mert_\AppData\Local\Temp\WB_Mert_12392_2\wbnew_files\dp0\SYS\DM\SYS.agdb
Type	DesignModeler
Length Unit	Meters
Element Control	Program Controlled
Display Style	Body Color
Bounding Box	
Length X	1000, mm
Length Y	400, mm
Length Z	10, mm
Properties	
Volume	3,6858e+006 mm³
Mass	26,538 kg
Scale Factor Value	1,
Statistics	
Bodies	1
Active Bodies	1
Nodes	26972
Elements	3731
Mesh Metric	None
Update Options	
Assign Default Material	No
Basic Geometry Options	
Parameters	Independent
Parameter Key	
Attributes	Yes
Attribute Key	
Named Selections	Yes
Named Selection Key	

Material Properties	Yes
Advanced Geometry Options	
Use Associativity	Yes
Coordinate Systems	Yes
Coordinate System Key	
Reader Mode Saves Updated File	No
Use Instances	Yes
Smart CAD Update	Yes
Compare Parts On Update	No
Analysis Type	3-D
Import Facet Quality	Source
Clean Bodies On Import	No
Stitch Surfaces On Import	None
Decompose Disjoint Geometry	Yes
Enclosure and Symmetry Processing	Yes

TABLE 5
Model (A4) > Geometry > Parts

Object Name	*Solid*
State	Meshed
Graphics Properties	
Visible	Yes
Transparency	1
Definition	
Suppressed	No
Stiffness Behavior	Flexible
Coordinate System	Default Coordinate System
Reference Temperature	By Environment
Treatment	None
Material	
Assignment	Gray Cast Iron
Nonlinear Effects	Yes

Thermal Strain Effects	Yes
Bounding Box	
Length X	1000, mm
Length Y	400, mm
Length Z	10, mm
Properties	
Volume	3,6858e+006 mm³
Mass	26,538 kg
Centroid X	500, mm
Centroid Y	200, mm
Centroid Z	5, mm
Moment of Inertia Ip1	3,7862e+005 kg·mm²
Moment of Inertia Ip2	2,3946e+006 kg·mm²
Moment of Inertia Ip3	2,7728e+006 kg·mm²
Statistics	
Nodes	26972
Elements	3731
Mesh Metric	None

FIGURE 1
Model (A4) > Geometry > Solid > Figure

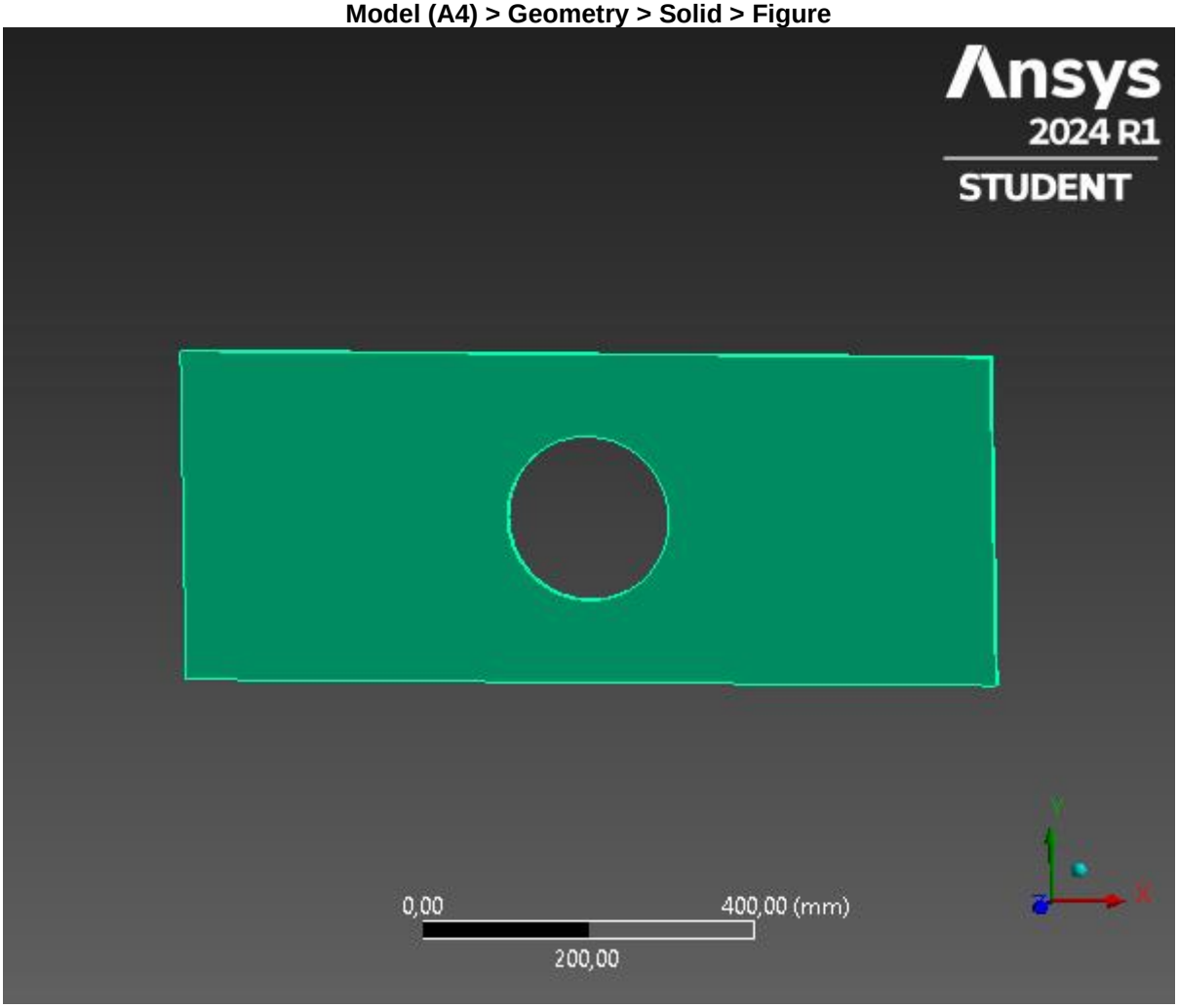


TABLE 6
Model (A4) > Materials

Object Name	*Materials*
State	Fully Defined
Statistics	
Materials	2
Material Assignments	0

Coordinate Systems

TABLE 7
Model (A4) > Coordinate Systems > Coordinate System

Object Name	*Global Coordinate System*
State	Fully Defined
Definition	
Type	Cartesian
Coordinate System ID	0,
Origin	
Origin X	0, mm
Origin Y	0, mm
Origin Z	0, mm
Directional Vectors	
X Axis Data	[1, 0, 0,]
Y Axis Data	[0, 1, 0,]
Z Axis Data	[0, 0, 1,]
Transfer Properties	
Source	
Read Only	No

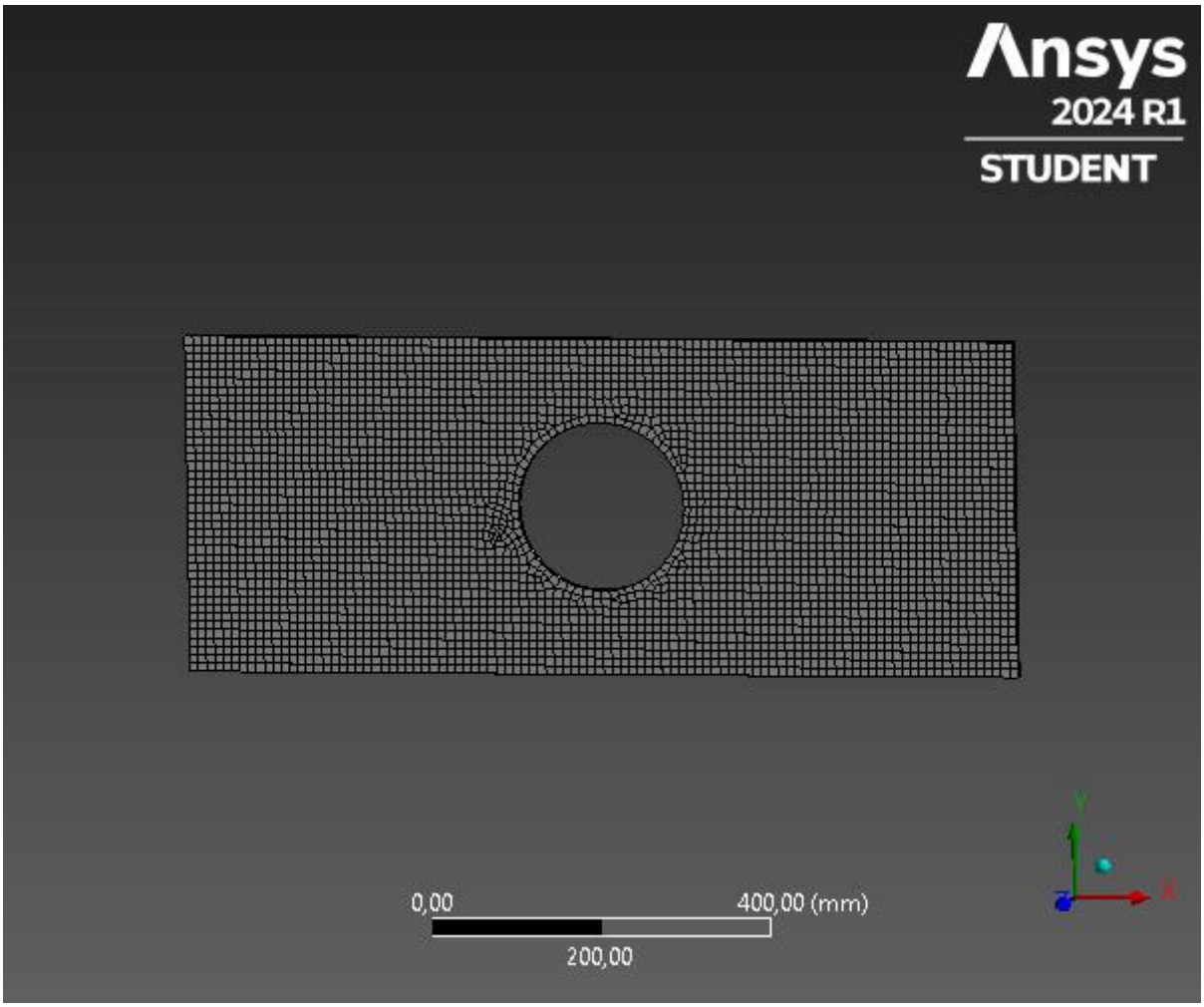
Mesh

TABLE 8
Model (A4) > Mesh

Object Name	*Mesh*
State	Solved
Display	
Display Style	Use Geometry Setting
Defaults	
Physics Preference	Mechanical
Element Order	Program Controlled
Element Size	10, mm
Sizing	
Use Adaptive Sizing	Yes
Resolution	Default (2)
Mesh Defeaturing	Yes
Defeature Size	Default
Transition	Fast
Span Angle Center	Coarse
Initial Size Seed	Assembly
Bounding Box Diagonal	1077,1 mm
Average Surface Area	1,1025e+005 mm²
Minimum Edge Length	10, mm
Quality	
Check Mesh Quality	Yes, Errors

Error Limits	Aggressive Mechanical
Target Element Quality	Default (5,e-002)
Smoothing	Medium
Mesh Metric	None
Inflation	
Use Automatic Inflation	None
Inflation Option	Smooth Transition
Transition Ratio	0,272
Maximum Layers	5
Growth Rate	1,2
Inflation Algorithm	Pre
Inflation Element Type	Wedges
View Advanced Options	No
Advanced	
Number of CPUs for Parallel Part Meshing	Program Controlled
Straight Sided Elements	No
Rigid Body Behavior	Dimensionally Reduced
Triangle Surface Mesher	Program Controlled
Topology Checking	Yes
Pinch Tolerance	Please Define
Generate Pinch on Refresh	No
Statistics	
Nodes	26972
Elements	3731
Show Detailed Statistics	No

FIGURE 2
Model (A4) > Mesh > Figure



Static Structural (A5)

TABLE 9
Model (A4) > Analysis

Object Name	*Static Structural (A5)*
State	Solved
Definition	
Physics Type	Structural
Analysis Type	Static Structural
Solver Target	Mechanical APDL
Options	
Environment Temperature	22, °C
Generate Input Only	No

TABLE 10
Model (A4) > Static Structural (A5) > Analysis Settings

Object Name	*Analysis Settings*
State	Fully Defined
Step Controls	
Number Of Steps	1,
Current Step Number	1,

Step End Time	1, s
Auto Time Stepping	Program Controlled
Solver Controls	
Solver Type	Program Controlled
Weak Springs	On
Spring Stiffness	Program Controlled
Solver Pivot Checking	Program Controlled
Large Deflection	Off
Inertia Relief	Off
Quasi-Static Solution	Off
Rotordynamics Controls	
Coriolis Effect	Off
Restart Controls	
Generate Restart Points	Program Controlled
Retain Files After Full Solve	No
Combine Restart Files	Program Controlled
Nonlinear Controls	
Newton-Raphson Option	Program Controlled
Force Convergence	Program Controlled
Moment Convergence	Program Controlled
Displacement Convergence	Program Controlled
Rotation Convergence	Program Controlled
Line Search	Program Controlled
Stabilization	Program Controlled
Advanced	
Inverse Option	No
Contact Split (DMP)	Program Controlled
Output Controls	
Stress	Yes
Back Stress	No
Strain	Yes
Contact Data	Yes
Nonlinear Data	No
Nodal Forces	No
Volume and Energy	Yes

Euler Angles	Yes
General Miscellaneous	No
Contact Miscellaneous	No
Store Results At	All Time Points
Result File Compression	Program Controlled
Analysis Data Management	
Solver Files Directory	C:\Users\mert_\AppData\Local\Temp\WB_Mert_12392_2\wbnew_files\dp0\SYS\MECH\
Future Analysis	None
Scratch Solver Files Directory	
Save MAPDL db	No
Contact Summary	Program Controlled
Delete Unneeded Files	Yes
Nonlinear Solution	No
Solver Units	Active System
Solver Unit System	nmm

FIGURE 3
Model (A4) > Static Structural (A5) > Figure

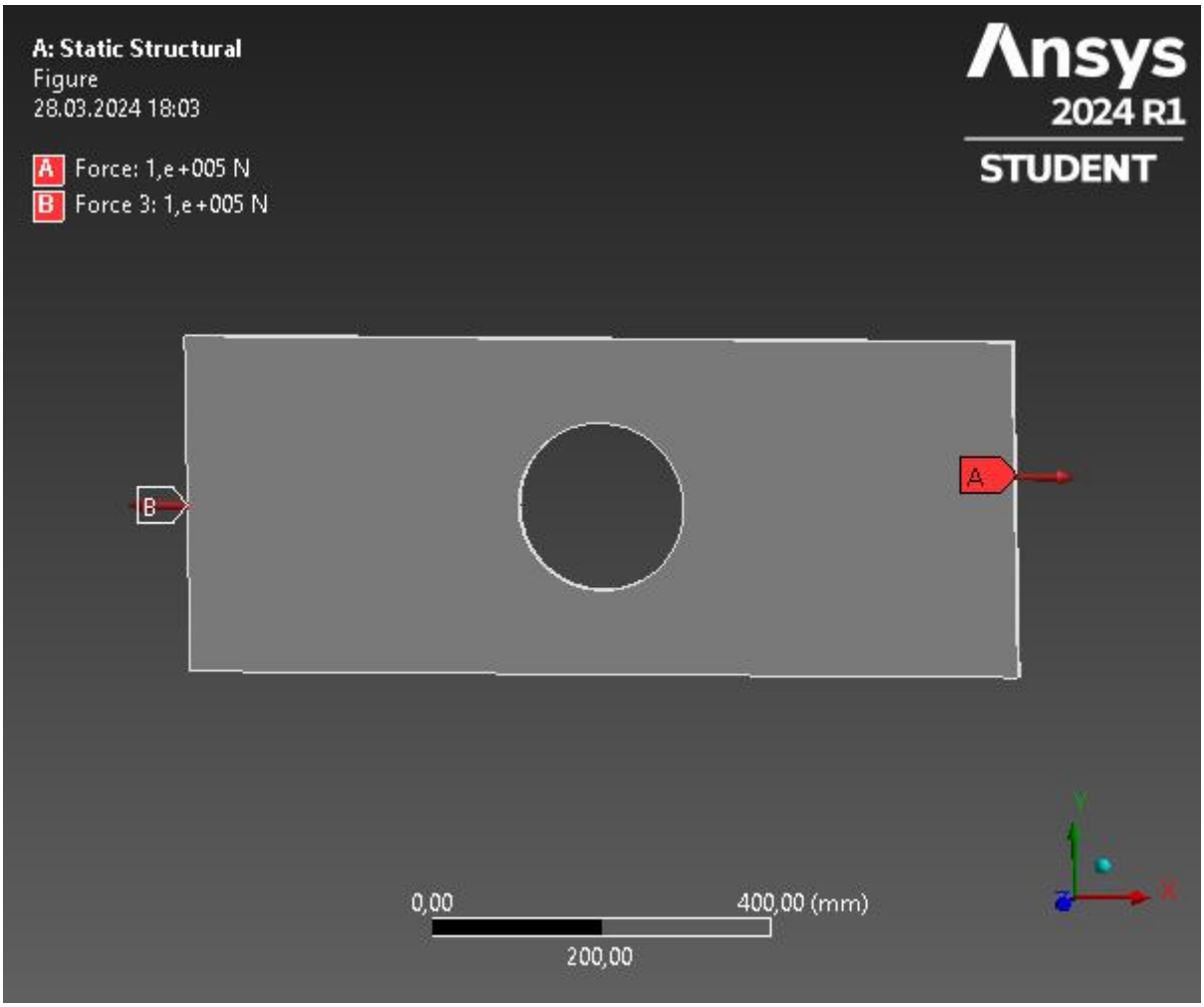


TABLE 11
Model (A4) > Static Structural (A5) > Loads

Object Name	*Force*	*Force 3*
State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Geometry	1 Face	
Definition		
Type	Force	
Define By	Vector	
Applied By	Surface Effect	
Magnitude	1,e+005 N (ramped)	
Direction	Defined	
Suppressed	No	

FIGURE 4
Model (A4) > Static Structural (A5) > Force

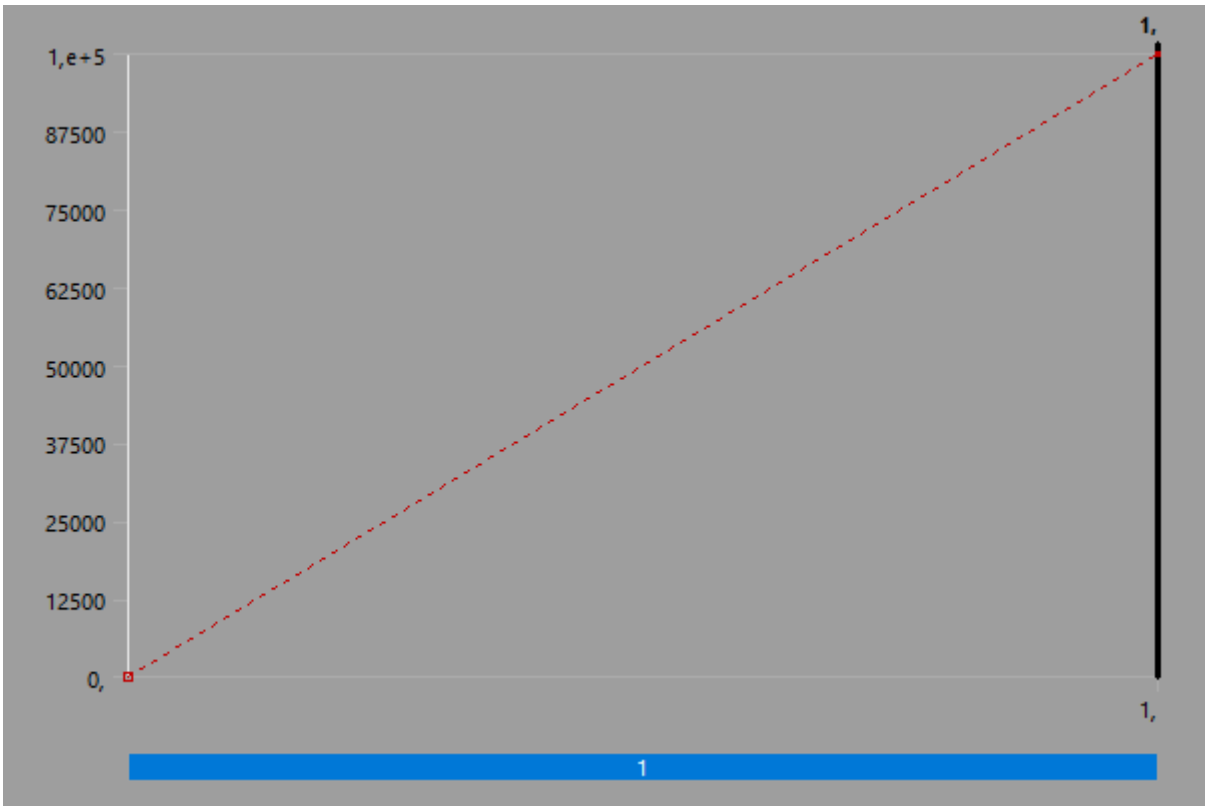
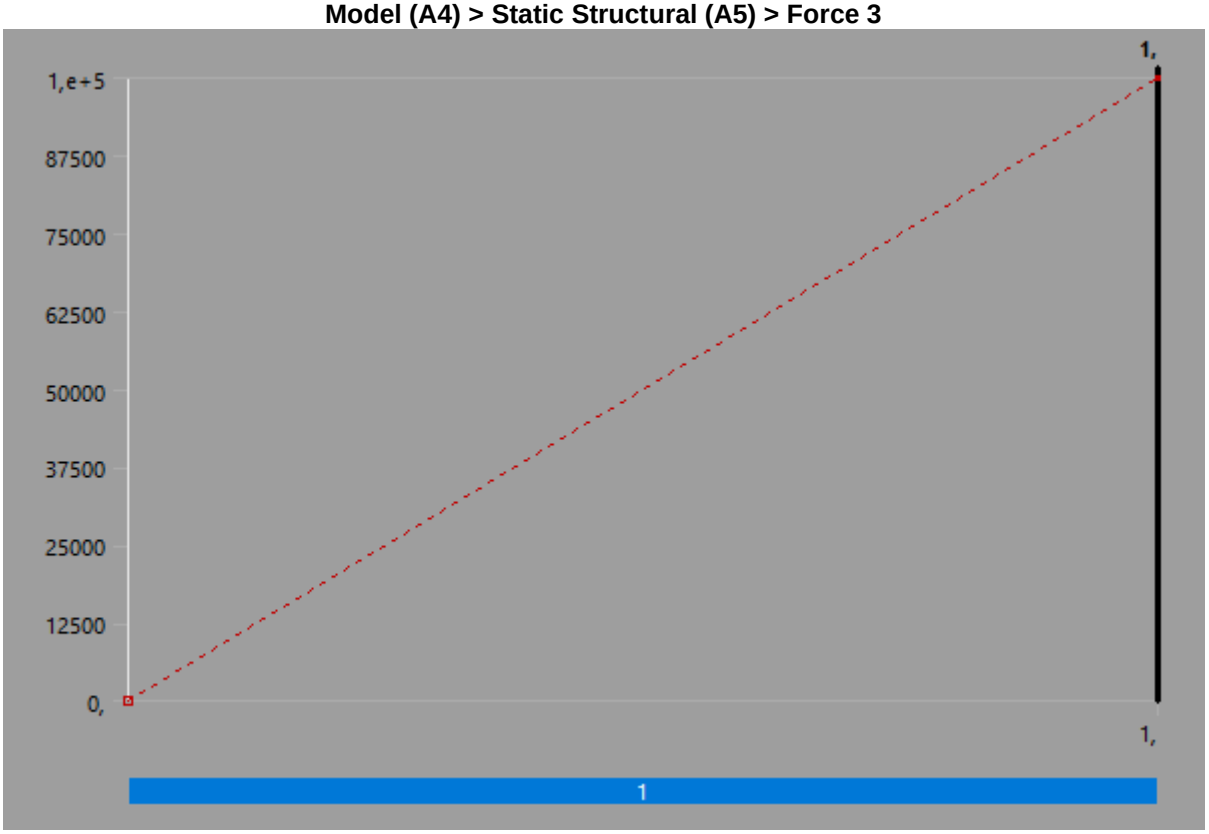


FIGURE 5
Model (A4) > Static Structural (A5) > Force 3



Solution (A6)

TABLE 12
Model (A4) > Static Structural (A5) > Solution

Object Name	*Solution (A6)*
State	Solved
Adaptive Mesh Refinement	
Max Refinement Loops	1,
Refinement Depth	2,
Information	
Status	Done
MAPDL Elapsed Time	3, s
MAPDL Memory Used	657, MB
MAPDL Result File Size	5,125 MB
Post Processing	
Beam Section Results	No
On Demand Stress/Strain	No

TABLE 13
Model (A4) > Static Structural (A5) > Solution (A6) > Solution Information

Object Name	*Solution Information*
State	Solved
Solution Information	
Solution Output	Solver Output
Newton-Raphson Residuals	0
Identify Element Violations	0
Update Interval	2,5 s
Display Points	All
FE Connection Visibility	
Activate Visibility	Yes
Display	All FE Connectors
Draw Connections Attached To	All Nodes
Line Color	Connection Type
Visible on Results	No
Line Thickness	Single
Display Type	Lines

TABLE 14
Model (A4) > Static Structural (A5) > Solution (A6) > Results

Object Name	*Total Deformation*	*Normal Stress*	*Shear Stress*	*Structural Error*	*Maximum Principal Stress*	*Minimum Principal Stress*
State	Solved					
Scope						
Scoping Method	Geometry Selection					
Geometry	All Bodies					
Definition						
Type	Total Deformation	Normal Stress	Shear Stress	Structural Error	Maximum Principal Stress	Minimum Principal Stress
By	Time					
Display Time	Last					
Separate Data by Entity	No					

Calculate Time History	Yes					
Identifier						
Suppressed	No					
Orientation		X Axis	XY Component			
Coordinate System		Global Coordinate System				
Results						
Minimum	4,1969e-002 mm	-3,9036 MPa	-26,918 MPa	2,9002e-010 mJ	-4,0147e-002 MPa	-40,467 MPa
Maximum	0,15112 mm	108,37 MPa	27,147 MPa	1,5734e-003 mJ	108,44 MPa	4,9781e-002 MPa
Average	9,8829e-002 mm	27,126 MPa	-4,75e-003 MPa		27,666 MPa	-1,5649 MPa
Minimum Occurs On	Solid					
Maximum Occurs On	Solid					
Total				6,4936e-002 mJ		
Information						
Time	1, s					
Load Step	1					
Substep	1					
Iteration Number	1					
Integration Point Results						
Display Option		Averaged			Averaged	
Average Across Bodies		No			No	

FIGURE 6
Model (A4) > Static Structural (A5) > Solution (A6) > Total Deformation

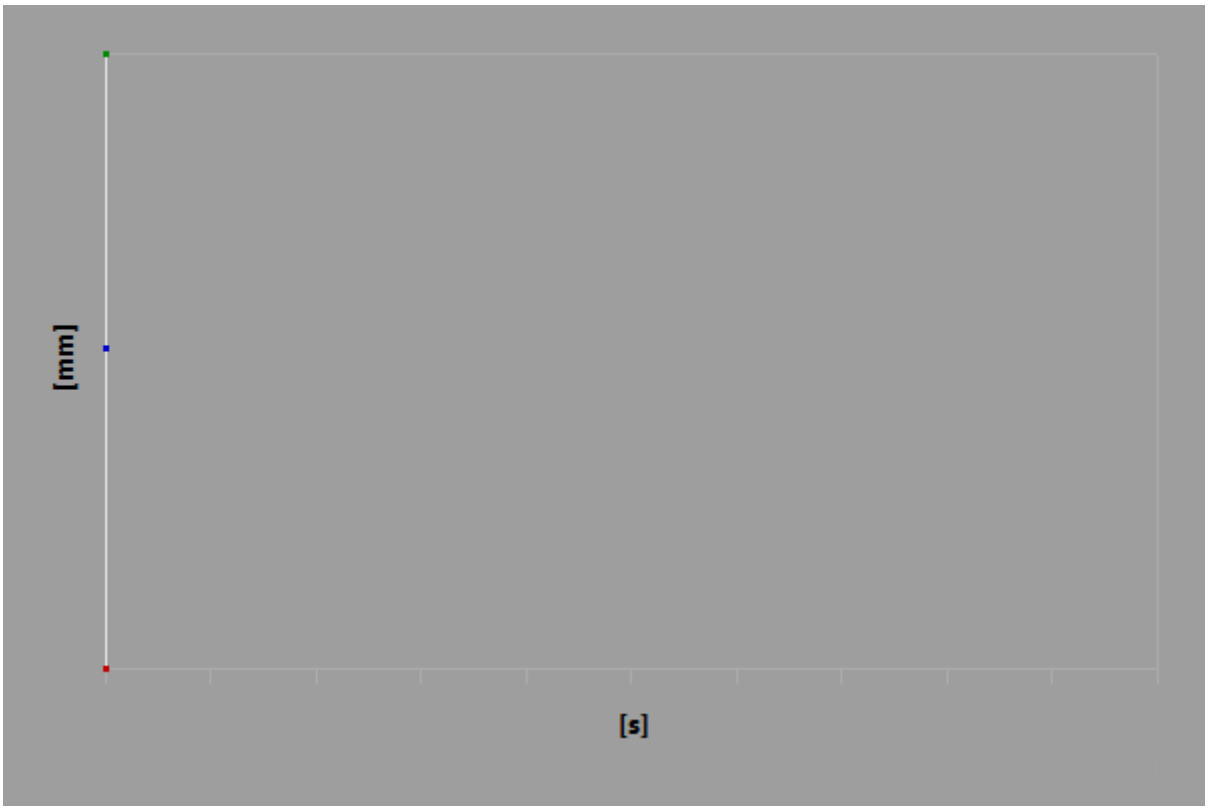


TABLE 15
Model (A4) > Static Structural (A5) > Solution (A6) > Total Deformation

Time [s]	Minimum [mm]	Maximum [mm]	Average [mm]
1,	4,1969e-002	0,15112	9,8829e-002

FIGURE 7
Model (A4) > Static Structural (A5) > Solution (A6) > Total Deformation > Figure

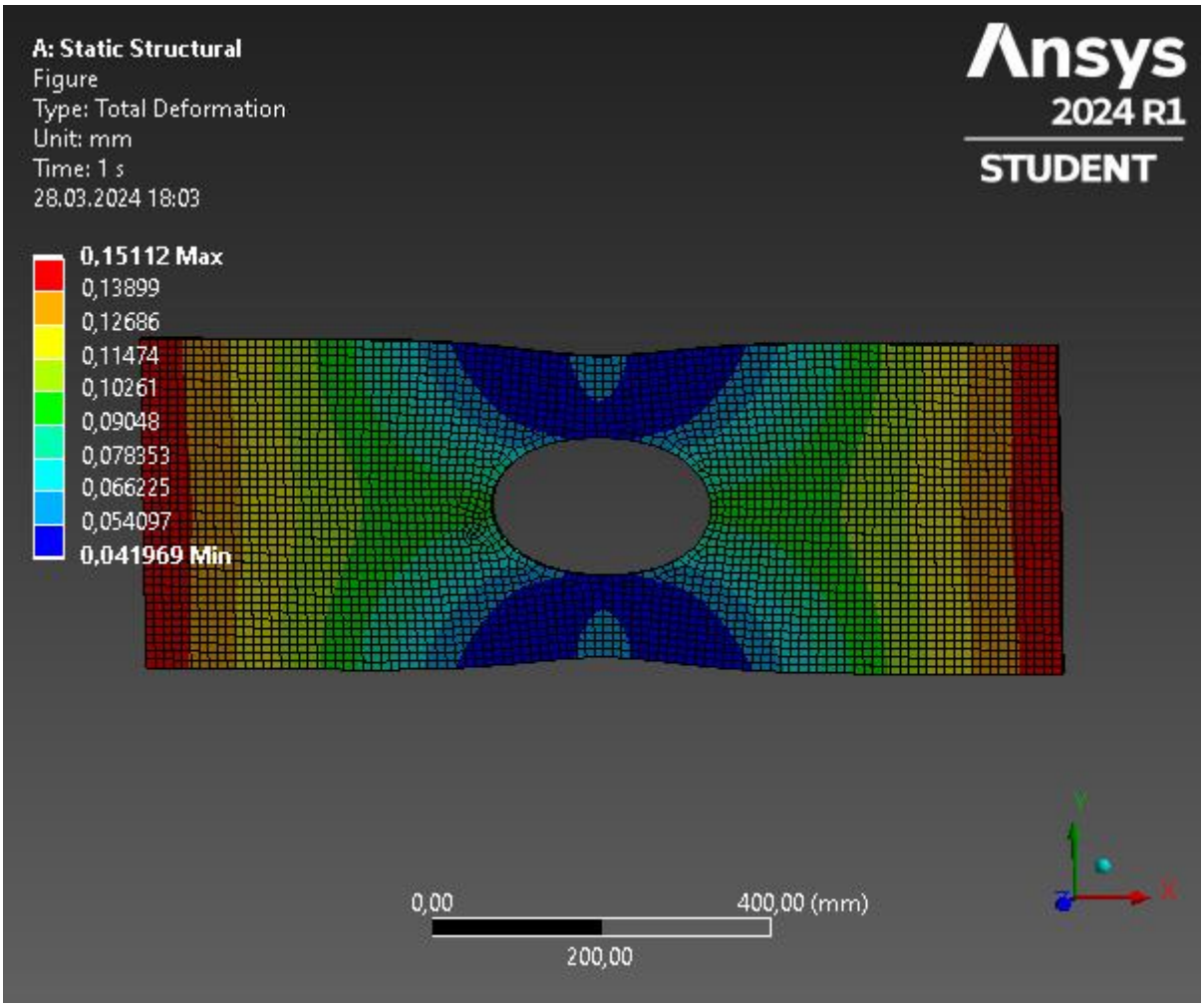


FIGURE 8
Model (A4) > Static Structural (A5) > Solution (A6) > Normal Stress

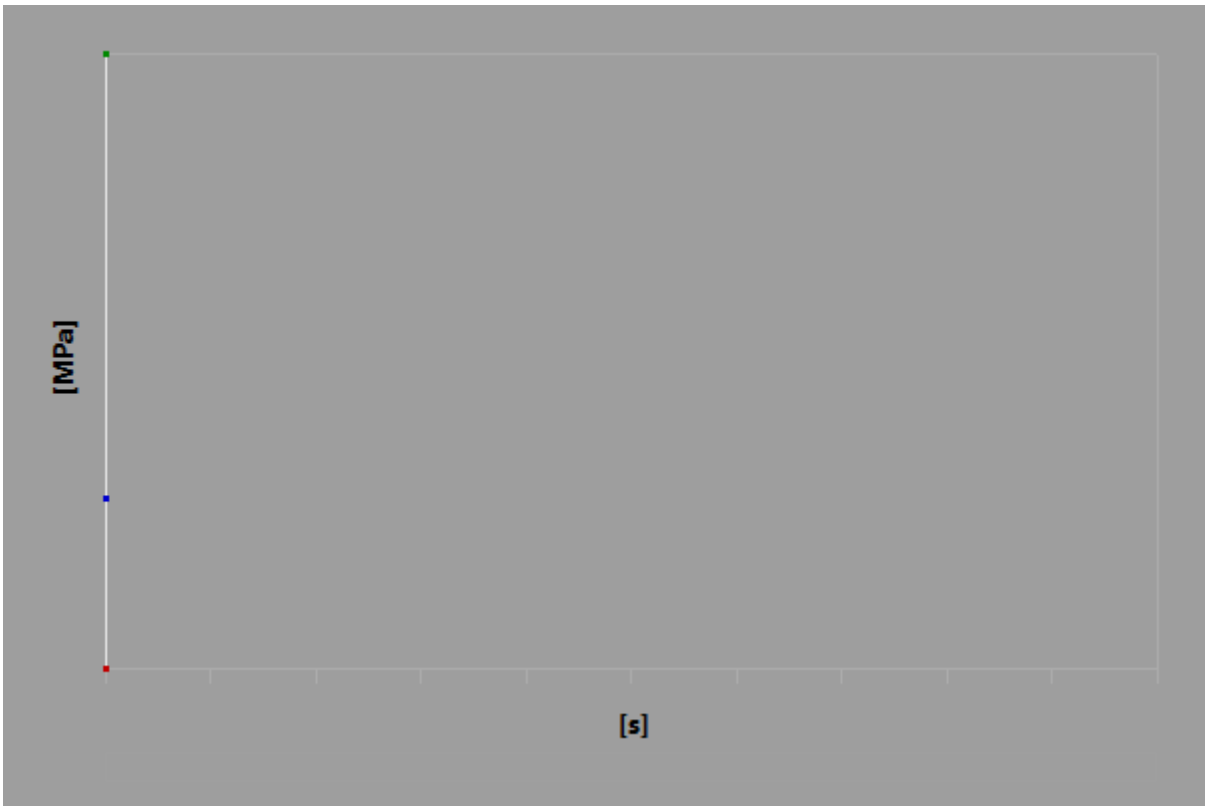


TABLE 16
Model (A4) > Static Structural (A5) > Solution (A6) > Normal Stress

Time [s]	Minimum [MPa]	Maximum [MPa]	Average [MPa]
1,	-3,9036	108,37	27,126

FIGURE 9
Model (A4) > Static Structural (A5) > Solution (A6) > Normal Stress > Figure

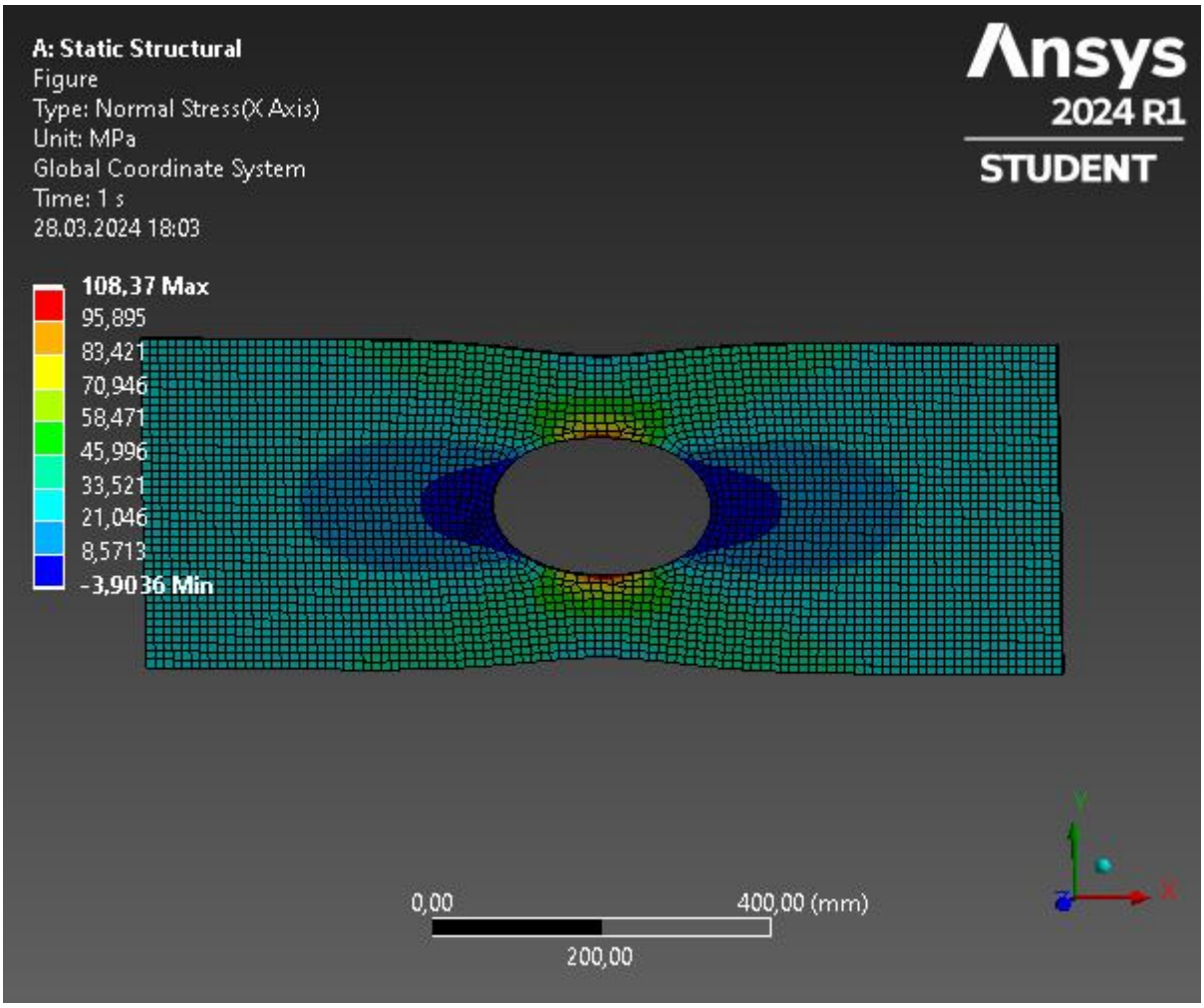


FIGURE 10
Model (A4) > Static Structural (A5) > Solution (A6) > Shear Stress

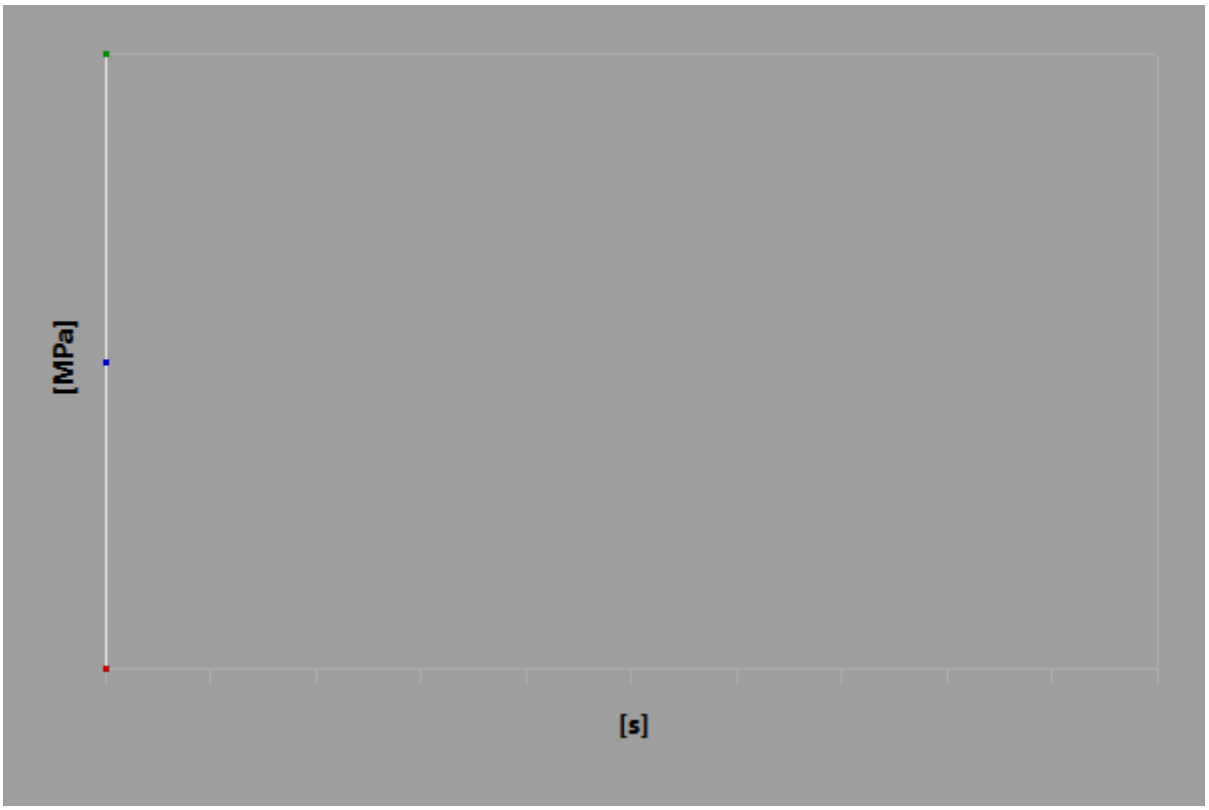


TABLE 17
Model (A4) > Static Structural (A5) > Solution (A6) > Shear Stress

Time [s]	Minimum [MPa]	Maximum [MPa]	Average [MPa]
1,	-26,918	27,147	-4,75e-003

FIGURE 11
Model (A4) > Static Structural (A5) > Solution (A6) > Shear Stress > Figure

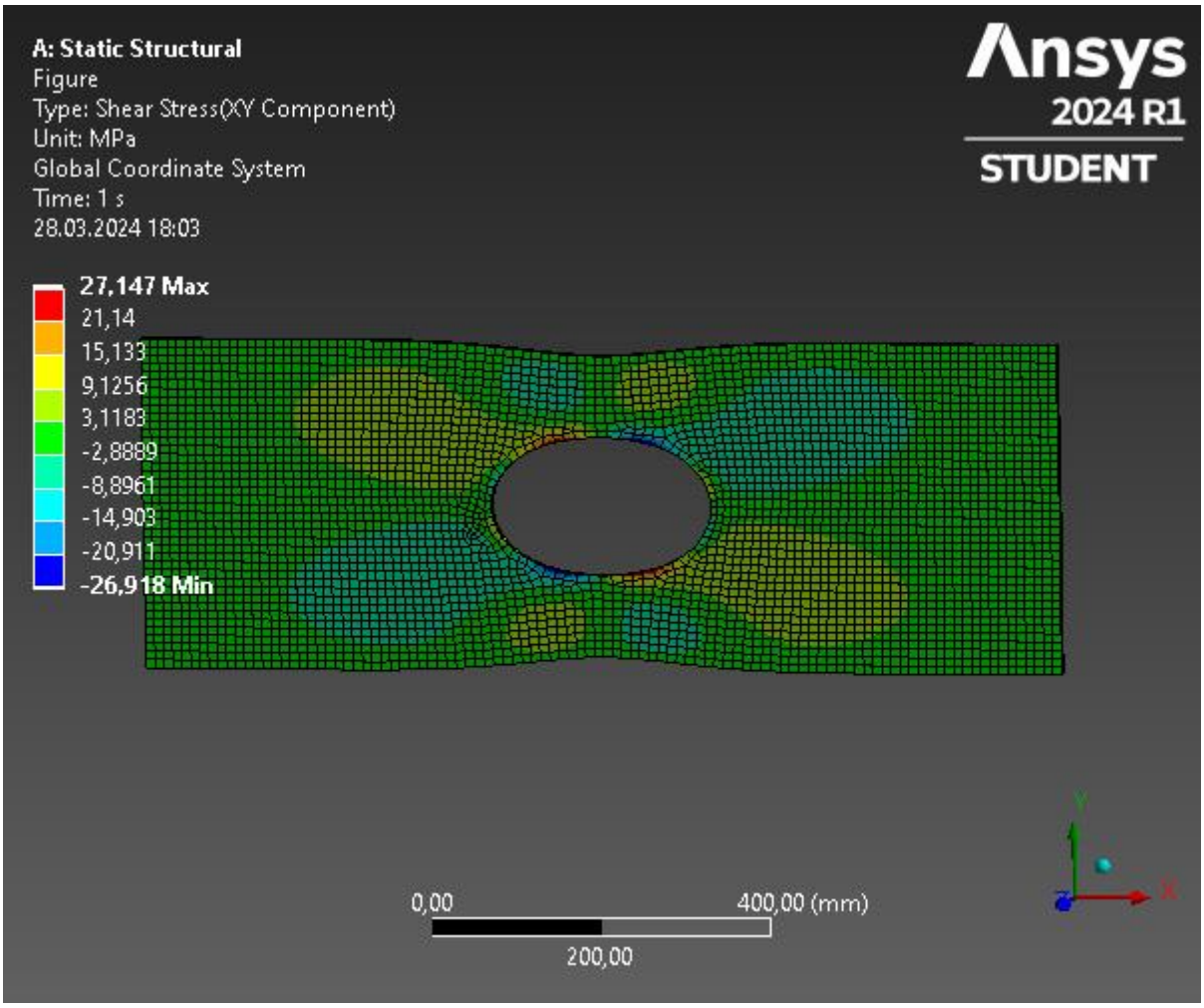


FIGURE 12
Model (A4) > Static Structural (A5) > Solution (A6) > Structural Error

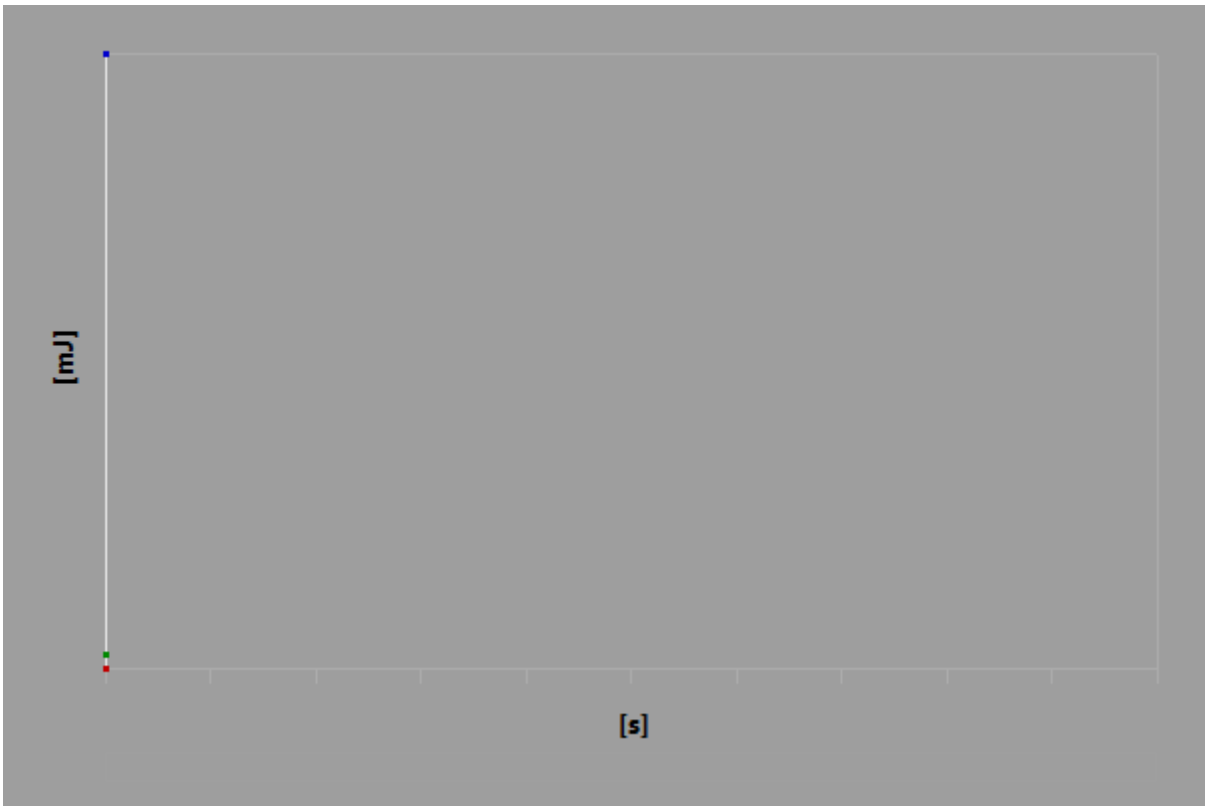


TABLE 18
Model (A4) > Static Structural (A5) > Solution (A6) > Structural Error

Time [s]	Minimum [mJ]	Maximum [mJ]	Total [mJ]
1,	2,9002e-010	1,5734e-003	6,4936e-002

FIGURE 13
Model (A4) > Static Structural (A5) > Solution (A6) > Structural Error > Figure

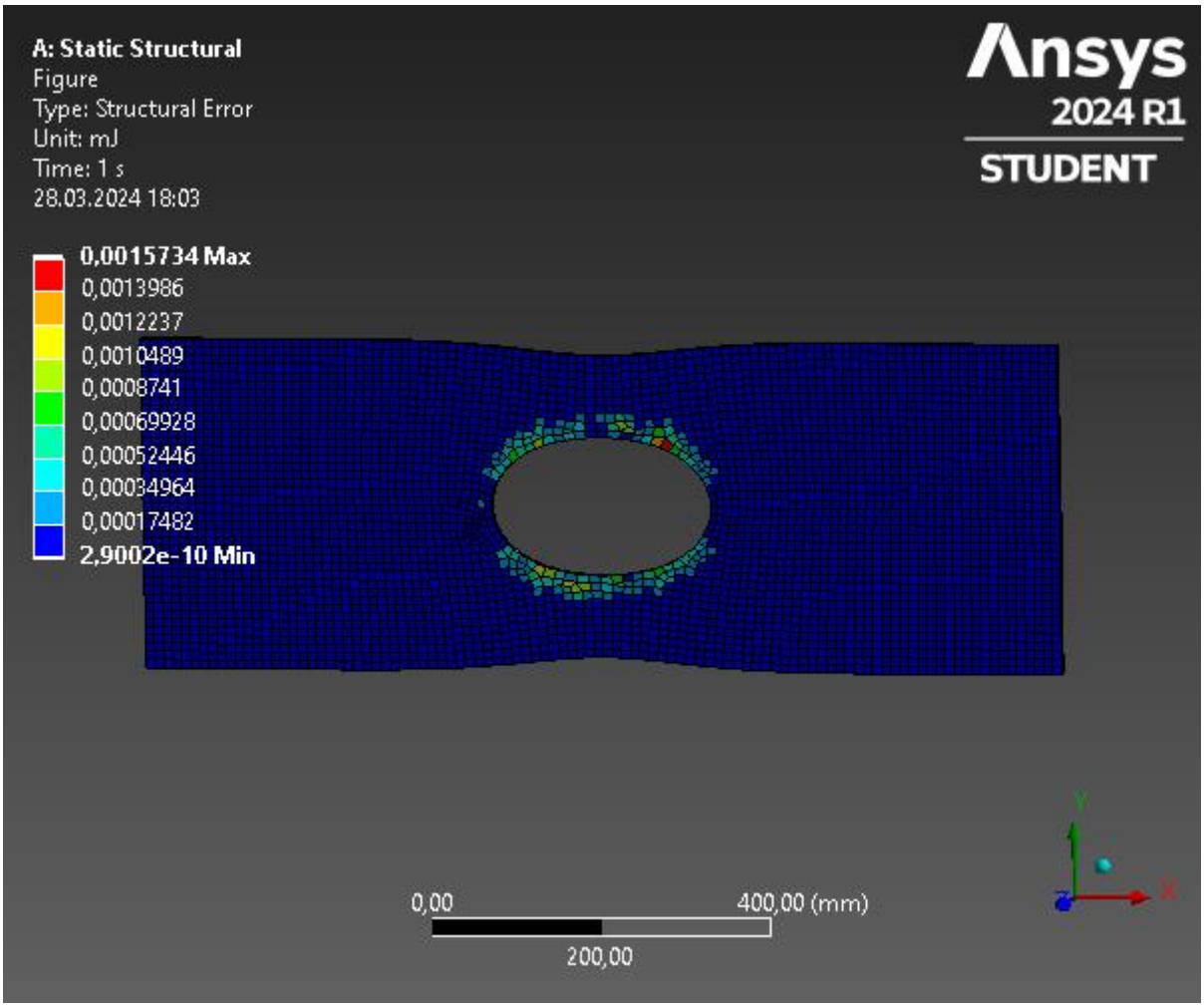


FIGURE 14
Model (A4) > Static Structural (A5) > Solution (A6) > Maximum Principal Stress

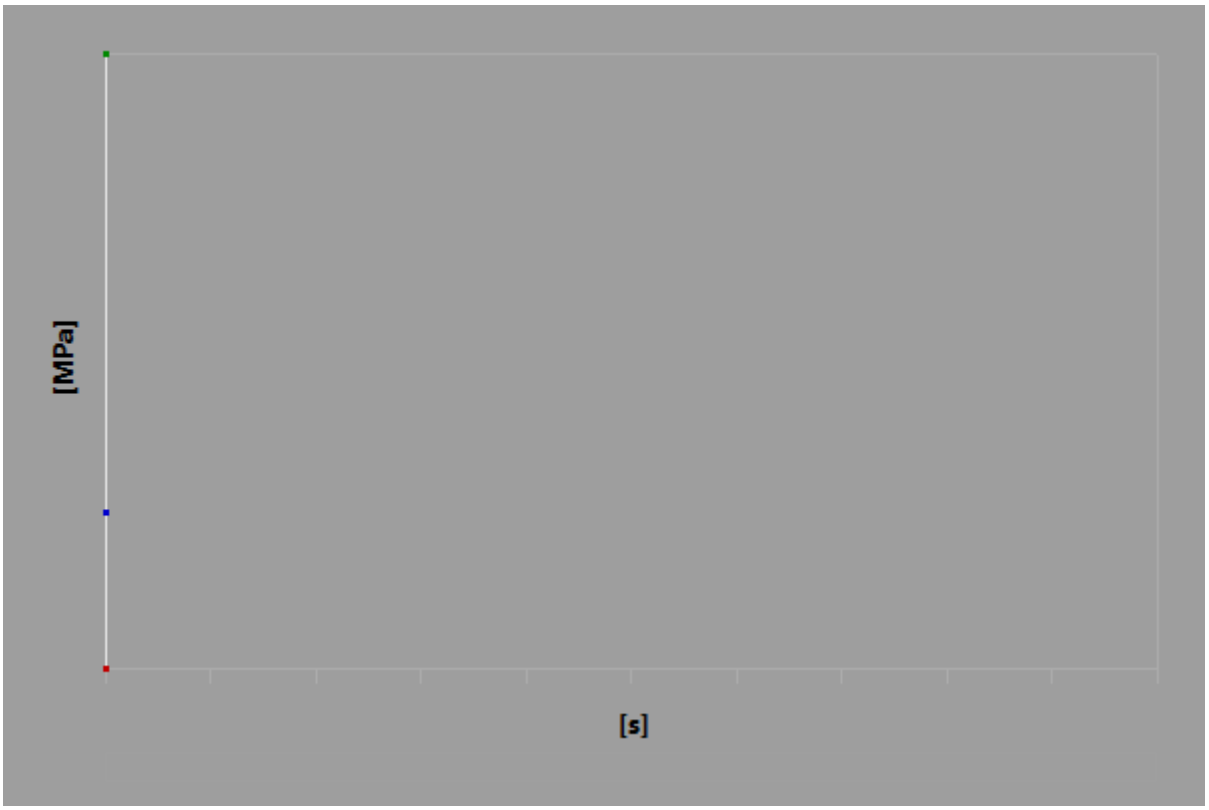


TABLE 19
Model (A4) > Static Structural (A5) > Solution (A6) > Maximum Principal Stress

Time [s]	Minimum [MPa]	Maximum [MPa]	Average [MPa]
1,	-4,0147e-002	108,44	27,666

FIGURE 15
Model (A4) > Static Structural (A5) > Solution (A6) > Maximum Principal Stress > Figure

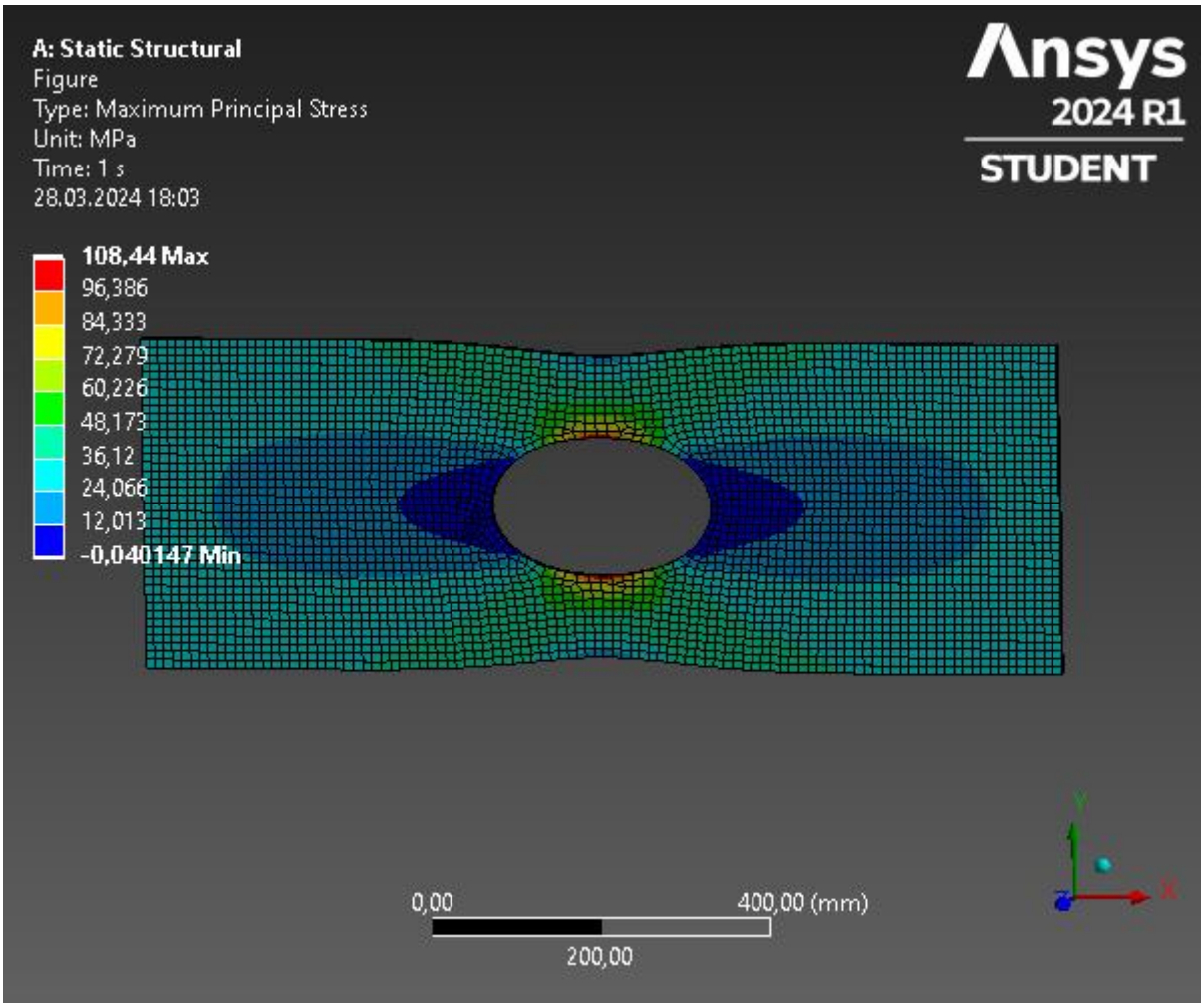


FIGURE 16
Model (A4) > Static Structural (A5) > Solution (A6) > Minimum Principal Stress

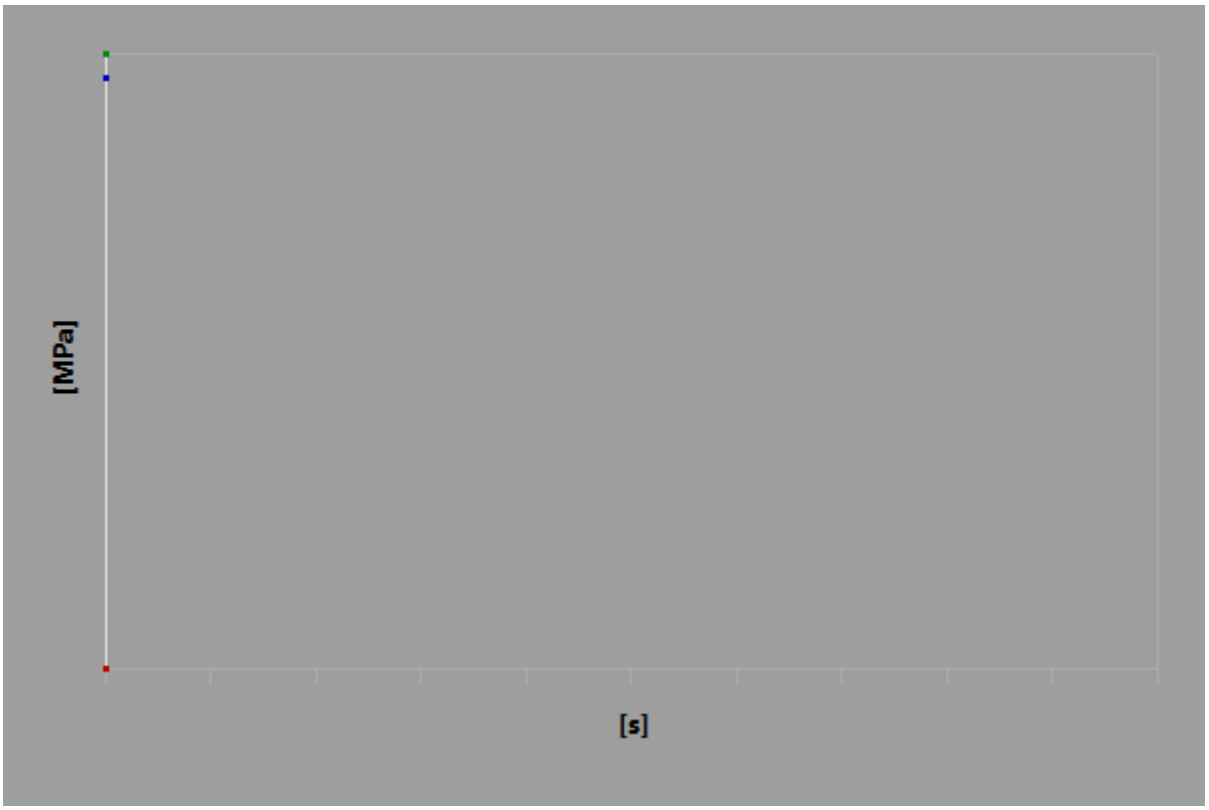


TABLE 20
Model (A4) > Static Structural (A5) > Solution (A6) > Minimum Principal Stress

Time [s]	Minimum [MPa]	Maximum [MPa]	Average [MPa]
1,	-40,467	4,9781e-002	-1,5649

FIGURE 17
Model (A4) > Static Structural (A5) > Solution (A6) > Minimum Principal Stress > Figure

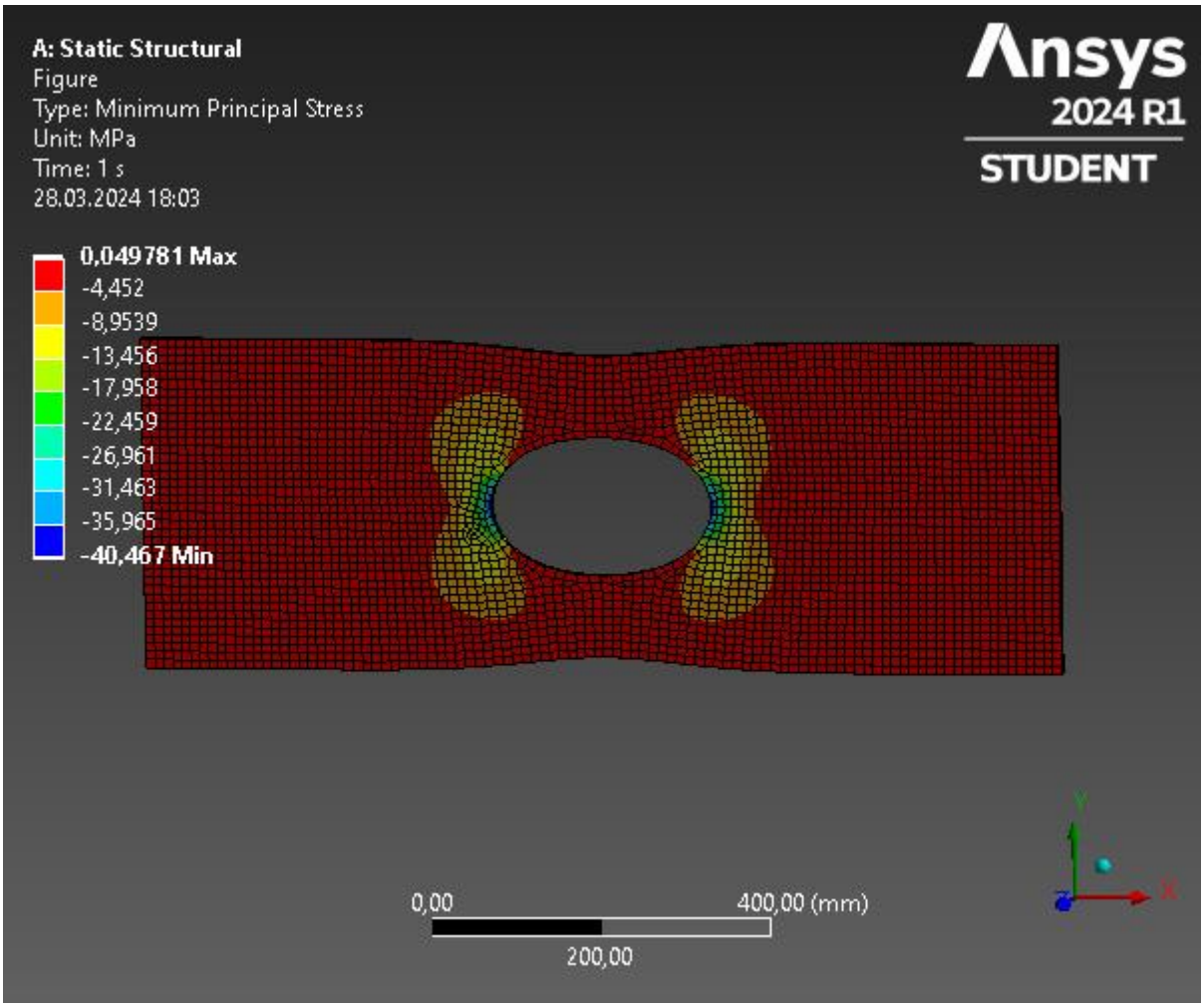


TABLE 21
Model (A4) > Static Structural (A5) > Solution (A6) > Stress Safety Tools

Object Name	*Stress Tool*
State	Solved
Definition	
Theory	Mohr-Coulomb Stress
Tensile Limit Type	Tensile Ultimate Per Material
Compressive Limit Type	Comp. Ultimate Per Material

TABLE 22
Model (A4) > Static Structural (A5) > Solution (A6) > Stress Tool > Results

Object Name	*Safety Factor*
State	Solved
Scope	
Scoping Method	Geometry Selection
Geometry	All Bodies
Definition	
Type	Safety Factor
By	Time
Display Time	Last
Separate Data by Entity	No
Calculate Time History	Yes
Identifier	

Suppressed	No
Integration Point Results	
Display Option	Averaged
Average Across Bodies	No
Results	
Minimum	2,2132
Minimum Occurs On	Solid
Information	
Time	1, s
Load Step	1
Substep	1
Iteration Number	1

FIGURE 18
Model (A4) > Static Structural (A5) > Solution (A6) > Stress Tool > Safety Factor

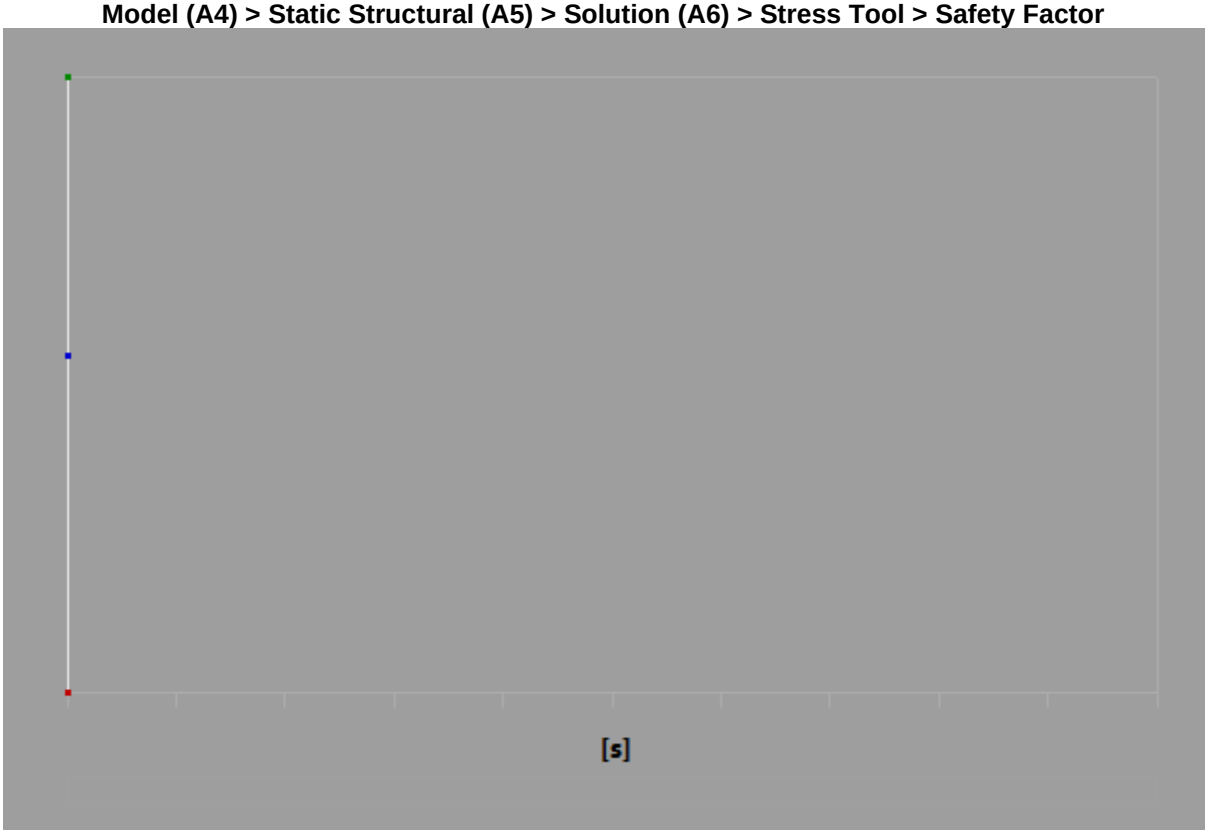
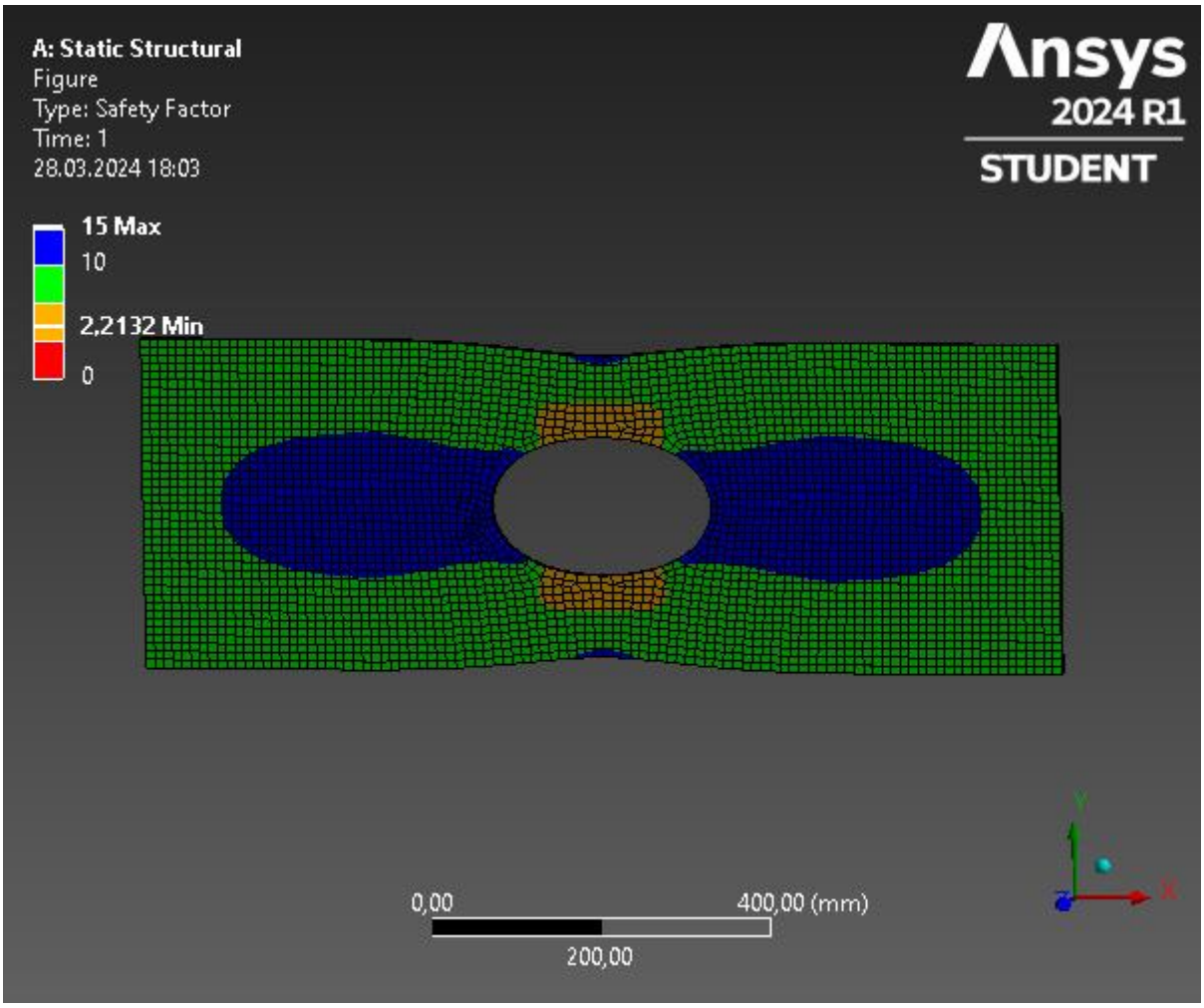


TABLE 23
Model (A4) > Static Structural (A5) > Solution (A6) > Stress Tool > Safety Factor

Time [s]	Minimum	Maximum	Average
1,	2,2132	15,	9,2281

FIGURE 19
Model (A4) > Static Structural (A5) > Solution (A6) > Stress Tool > Safety Factor > Figure



Material Data

Gray Cast Iron

TABLE 24
Gray Cast Iron > Constants

Density	7,2e-006 kg mm^-3
Coefficient of Thermal Expansion	1,1e-005 C^-1
Specific Heat	4,47e+005 mJ kg^-1 C^-1
Thermal Conductivity	5,2e-002 W mm^-1 C^-1
Resistivity	9,6e-005 ohm mm

TABLE 25
Gray Cast Iron > Color

Red	Green	Blue
161,	161,	161,

TABLE 26
Gray Cast Iron > Compressive Ultimate Strength

Compressive Ultimate Strength MPa
820,

TABLE 27
Gray Cast Iron > Compressive Yield Strength

Compressive Yield Strength MPa
0,

TABLE 28
Gray Cast Iron > Tensile Yield Strength

Tensile Yield Strength MPa
0,

TABLE 29
Gray Cast Iron > Tensile Ultimate Strength

Tensile Ultimate Strength MPa
240,

TABLE 30
Gray Cast Iron > Isotropic Secant Coefficient of Thermal Expansion

Zero-Thermal-Strain Reference Temperature C
22,

TABLE 31
Gray Cast Iron > Isotropic Elasticity

Young's Modulus MPa	Poisson's Ratio	Bulk Modulus MPa	Shear Modulus MPa	Temperature C
1,1e+005	0,28	83333	42969	

TABLE 32
Gray Cast Iron > Isotropic Relative Permeability

Relative Permeability
10000