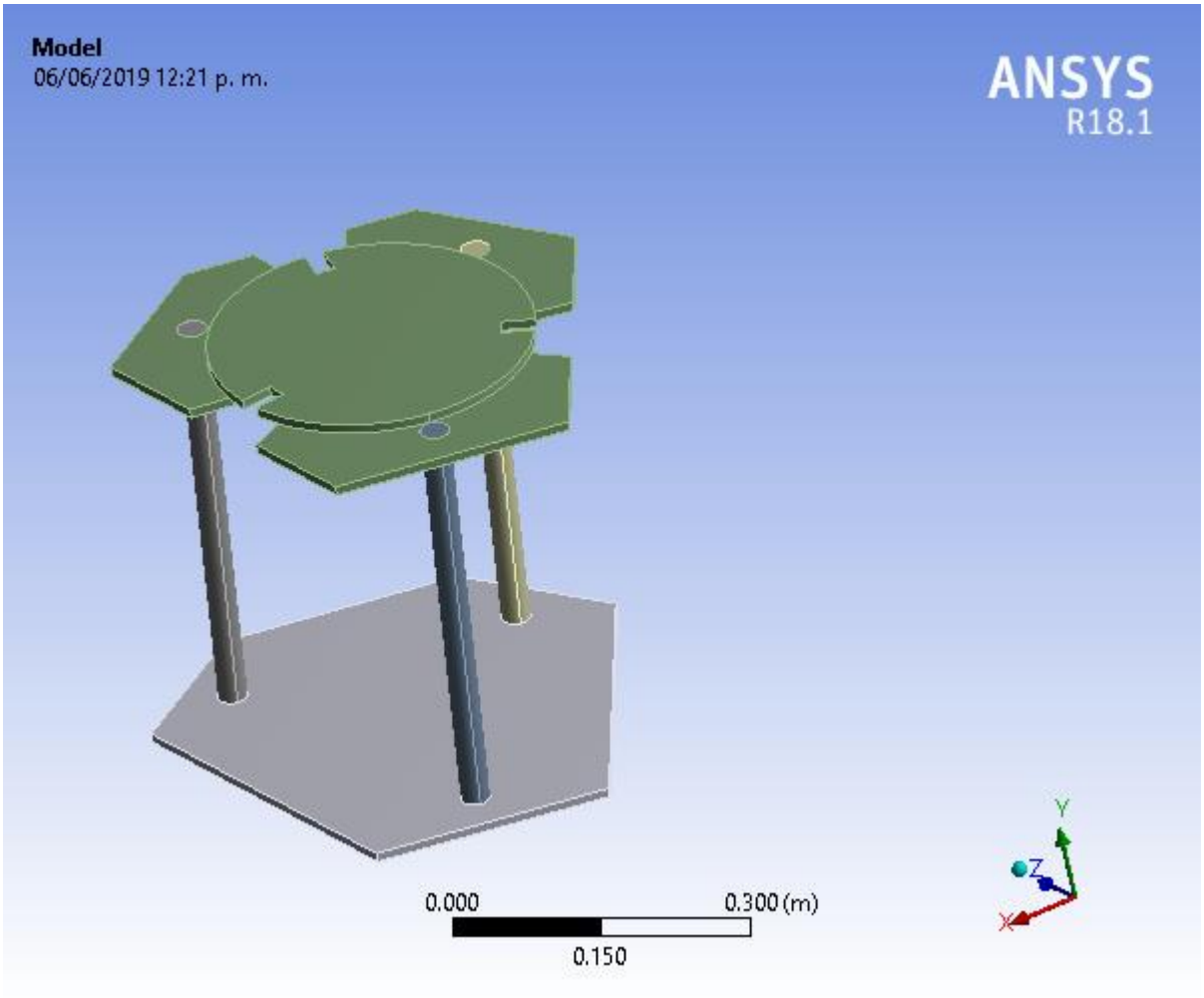
Project

First Saved	Thursday, June 6, 2019
Last Saved	Thursday, June 6, 2019
Product Version	18.1 Release
Save Project Before Solution	No
Save Project After Solution	No



Contents

Report Not Finalized

Not all objects described below are in a finalized state. As a result, data may be incomplete, obsolete or in error. View first state problem. To finalize this report, edit objects as needed and solve the analyses.

Units

TABLE 1

Unit System	Metric (m, kg, N, s, V, A) Degrees rad/s Celsius
Angle	Degrees
Rotational Velocity	rad/s
Temperature	Celsius

Model (B4)

Geometry

TABLE 2
Model (B4) > Geometry

Object Name	*Geometry*
State	Fully Defined
Definition	
Source	C:\Users\cesar\OneDrive\Desktop\braso garabito\Ensamblaje1.IGS

Type	Iges
Length Unit	Meters
Element Control	Program Controlled
Display Style	Body Color
Bounding Box	
Length X	0.58115 m
Length Y	0.58589 m
Length Z	0.62282 m
Properties	
Volume	4.8407e-003 m³
Mass	11.008 kg
Scale Factor Value	1.
Statistics	
Bodies	27
Active Bodies	5
Nodes	56793
Elements	11562
Mesh Metric	None
Basic Geometry Options	
Solid Bodies	Yes
Surface Bodies	Yes
Line Bodies	No
Parameters	Independent
Parameter Key	ANS;DS
Attributes	No
Named Selections	No
Material Properties	No
Advanced Geometry Options	
Use Associativity	Yes
Coordinate Systems	No
Reader Mode Saves Updated File	No
Use Instances	Yes
Smart CAD Update	Yes
Compare Parts On Update	No
Attach File Via Temp File	Yes
Temporary Directory	C:\Users\cesar\AppData\Local\Temp
Analysis Type	3-D
Mixed Import Resolution	None
Decompose Disjoint Geometry	Yes
Enclosure and Symmetry Processing	Yes

TABLE 3
Model (B4) > Geometry > Parts

Object Name	*Part 1*	*Part 2*	*Part 3*	*Part 4*	*Part 5*	*Part 6*	*Part 7*	*Part 8*	*Part 9*	*Part 10*	*Part 11*
State	Suppressed										
Graphics Properties											

Visible	No									
Definition										
Suppressed	Yes									
Stiffness Behavior	Flexible									
Coordinate System	Default Coordinate System									
Reference Temperature	By Environment									
Behavior	None									
Material										
Assignment	Structural Steel									
Nonlinear Effects	Yes									
Thermal Strain Effects	Yes									
Bounding Box										
Length X	7.358e-002 m	7.1143e-002 m		3.0721e-002 m	1.9472e-002 m	3.0721e-002 m	1.9472e-002 m	1.6443e-002 m	4.9718e-002 m	4.0725e-002 m
Length Y	2.4824e-002 m	0.10508 m		0.12822 m	0.13039 m	0.12822 m	0.13039 m	3.5087e-002 m	2.7657e-002 m	3.1245e-002 m
Length Z	6.8686e-002 m	6.6345e-002 m		3.5826e-002 m	1.6948e-002 m	3.5826e-002 m	1.6948e-002 m	5.2768e-002 m	1.72e-002 m	5.328e-002 m
Properties										
Volume	1.523e-005 m³	7.5864e-006 m³						3.6861e-006 m³		
Mass	0.11955 kg	5.9553e-002 kg						2.8936e-002 kg		
Centroid X	-6.4832e-002 m	-0.14519 m	-0.12506 m	4.0518e-002 m	-2.6374e-002 m	3.5527e-002 m	-6.4546e-002 m	2.066e-002 m	-4.0149e-002 m	-0.10075 m	-0.1695 m
Centroid Y	-0.12982 m	-7.8845e-002 m	-8.5683e-002 m	-6.732e-002 m	-5.2539e-002 m	-7.54e-002 m	-5.439e-002 m	-0.13116 m	-0.11603 m	-0.12713 m	-3.7394e-002 m
Centroid Z	0.52388 m	0.4889 m	0.4562 m	0.52472 m	0.62175 m	0.48689 m	0.61397 m	0.51887 m	0.60757 m	0.50177 m	0.44334 m
Moment of Inertia Ip1	2.6719e-005 kg·m²	6.7198e-007 kg·m²						1.2928e-006 kg·m²		
Moment of Inertia Ip2	2.6768e-005 kg·m²	8.0101e-005 kg·m²						5.2022e-006 kg·m²		
Moment of Inertia Ip3	5.2766e-005 kg·m²	7.9786e-005 kg·m²						4.0861e-006 kg·m²		
Statistics										
Nodes	0									
Elements	0									
Mesh Metric	None									

TABLE 4
Model (B4) > Geometry > Parts

Object Name	*Part 12*	*Part 13*	*Part 14*	*Part 15*	*Part 16*	*Part 17*	*Part 18*	*Part 19*	*Part 20*	*Part 21*	*Part 22*
State	Suppressed										
Graphics Properties											
Visible	No										
Definition											
Suppressed	Yes										
Stiffness Behavior	Flexible										
Coordinate System	Default Coordinate System										
Reference Temperature	By Environment										
Behavior	None										
Material											
Assignment	Structural Steel										
Nonlinear Effects	Yes										
Thermal Strain Effects	Yes										
Bounding Box											
Length X	1.6443e-002 m	4.9718e-002 m	9.2037e-002 m	3.5472e-002 m	2.2132e-002 m	2.8964e-002 m	4.8944e-002 m	6.3035e-002 m	4.0483e-002 m	3.7704e-002 m	1.4175e-002 m
Length Y	3.5087e-002 m	2.7657e-002 m	8.9711e-002 m	0.1003 m	0.10444 m	3.5148e-002 m	3.4033e-002 m	2.8752e-002 m	4.1387e-002 m	4.4783e-002 m	4.789e-002 m
Length Z	5.2768e-002 m	1.72e-002 m	3.1219e-002 m	3.7041e-002 m	6.0972e-002 m	6.5328e-002 m	6.5201e-002 m	3.6593e-002 m	1.9185e-002 m	3.3545e-002 m	4.8185e-002 m
Properties											
Volume	3.6861e-006 m³		8.4687e-006 m³			4.5227e-006 m³			9.1671e-006 m³		
Mass	2.8936e-002 kg		6.6479e-002 kg			3.5503e-002 kg			7.1962e-002 kg		
Centroid X	5.5385e-002 m	-5.0771e-002 m	9.3206e-002 m	-0.16638 m	-5.729e-002 m	0.10507 m	-0.16628 m	-4.7673e-002 m	0.1058 m	-0.16335 m	-5.3197e-002 m
Centroid Y	-1.1559e-002 m	9.1002e-003 m	3.9538e-002 m	2.5661e-002 m	7.3735e-002 m	5.6839e-002 m	5.1409e-002 m	9.8567e-002 m	5.7815e-002 m	5.0226e-002 m	9.8103e-002 m
Centroid Z	0.49274 m	0.62816 m	0.47735 m	0.43147 m	0.64225 m	0.46008 m	0.44004 m	0.64754 m	0.4656 m	0.43536 m	0.64644 m
Moment of Inertia Ip1	1.2928e-006 kg·m²		2.8776e-006 kg·m²			9.5682e-006 kg·m²			1.8762e-005 kg·m²		
Moment of Inertia Ip2	5.2022e-006 kg·m²		5.7166e-005 kg·m²			9.5315e-006 kg·m²			9.6059e-006 kg·m²		
Moment of Inertia Ip3	4.0861e-006 kg·m²		5.4686e-005 kg·m²			1.1984e-006 kg·m²			9.5874e-006 kg·m²		
Statistics											
Nodes	0										
Elements	0										
Mesh Metric	None										

TABLE 5
Model (B4) > Geometry > Parts

Object Name	*Part 23*	*Part 24*	*Part 25*	*Part 26*	*Part 27*
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Stiffness Behavior	Flexible				
Coordinate System	Default Coordinate System				
Reference Temperature	By Environment				
Behavior	None				
Material					
Assignment	Polyethylene	Structural Steel			Polyethylene
Nonlinear Effects	Yes				
Thermal Strain Effects	Yes				
Bounding Box					
Length X	0.58 m	3.6532e-002 m			0.58003 m
Length Y	0.12833 m	0.44683 m			0.13808 m
Length Z	0.52393 m	0.13339 m			0.52612 m
Properties					
Volume	1.636e-003 m³	3.0963e-004 m³			2.2758e-003 m³
Mass	1.5542 kg	2.4306 kg			2.162 kg
Centroid X	-3.4766e-002 m	-0.20733 m	9.0495e-002 m	1.8679e-003 m	-3.5813e-002 m
Centroid Y	-0.39694 m	-0.16538 m	-0.15093 m	-0.22125 m	3.5851e-002 m
Centroid Z	0.6078 m	0.63665 m	0.69735 m	0.38619 m	0.50992 m
Moment of Inertia Ip1	2.16e-002 kg·m²	2.6113e-004 kg·m²			2.4872e-002 kg·m²
Moment of Inertia Ip2	4.1777e-002 kg·m²	4.0756e-002 kg·m²			4.7415e-002 kg·m²
Moment of Inertia Ip3	2.0202e-002 kg·m²	4.0756e-002 kg·m²			2.2679e-002 kg·m²
Statistics					
Nodes	29810	6928			6199
Elements	4213	1470			2939
Mesh Metric	None				

Coordinate Systems

TABLE 6
Model (B4) > Coordinate Systems > Coordinate System

Object Name	*Global Coordinate System*
State	Fully Defined
Definition	

Type	Cartesian
Coordinate System ID	0.
Origin	
Origin X	0. m
Origin Y	0. m
Origin Z	0. m
Directional Vectors	
X Axis Data	[1. 0. 0.]
Y Axis Data	[0. 1. 0.]
Z Axis Data	[0. 0. 1.]

Connections

TABLE 7
Model (B4) > Connections

Object Name	*Connections*
State	Fully Defined
Auto Detection	
Generate Automatic Connection On Refresh	Yes
Transparency	
Enabled	Yes

TABLE 8
Model (B4) > Connections > Contacts

Object Name	*Contacts*
State	Fully Defined
Definition	
Connection Type	Contact
Scope	
Scoping Method	Geometry Selection
Geometry	All Bodies
Auto Detection	
Tolerance Type	Slider
Tolerance Slider	0.
Tolerance Value	2.5847e-003 m
Use Range	No
Face/Face	Yes
Face Overlap Tolerance	Off
Cylindrical Faces	Include
Face/Edge	No
Edge/Edge	No
Priority	Include All
Group By	Bodies
Search Across	Bodies
Statistics	
Connections	37
Active Connections	6

TABLE 9
Model (B4) > Connections > Contacts > Contact Regions

Object Name	*Contact Region*	*Contact Region 2*	*Contact Region 3*	*Contact Region 4*	*Contact Region 5*	*Contact Region 6*	*Contact Region 7*	*Contact Region 8*	*Contact Region 9*	*Contact Region 10*	*Contact Region 11*
State	Suppressed										
Scope											
Scoping Method	Geometry Selection										
Contact	No Selection										
Target	No Selection										
Contact Bodies	Part 1	Part 2		Part 3		Part 4		Part 5		Part 6	
Target Bodies	Part 10		Part 11	Part 10	Part 11	Part 8	Part 12	Part 9	Part 13	Part 8	Part 12
Definition											
Type	Bonded										
Scope Mode	Automatic										
Behavior	Program Controlled										
Trim Contact	Program Controlled										
Trim Tolerance	2.5847e-003 m										
Suppressed	No										
Advanced											
Formulation	Program Controlled										
Detection Method	Program Controlled										
Penetration Tolerance	Program Controlled										
Elastic Slip Tolerance	Program Controlled										
Normal Stiffness	Program Controlled										
Update Stiffness	Program Controlled										
Pinball Region	Program Controlled										
Geometric Modification											
Contact Geometry Correction	None										
Target Geometry Correction	None										

TABLE 10
Model (B4) > Connections > Contacts > Contact Regions

Object Name	*Contact Region 12*	*Contact Region 13*	*Contact Region 14*	*Contact Region 15*	*Contact Region 16*	*Contact Region 17*	*Contact Region 18*	*Contact Region 19*	*Contact Region 20*	*Contact Region 21*	*Contact Region 22*

State	Suppressed										
Scope											
Scoping Method	Geometry Selection										
Contact	No Selection										
Target	No Selection							1 Face	No Selection		1 Face
Contact Bodies	Part 7		Part 11	Part 12	Part 13	Part 14			Part 15		
Target Bodies	Part 9	Part 13	Part 15	Part 14	Part 16	Part 17	Part 20	Part 27	Part 18	Part 21	Part 27
Definition											
Type	Bonded										
Scope Mode	Automatic										
Behavior	Program Controlled										
Trim Contact	Program Controlled										
Trim Tolerance	2.5847e-003 m										
Suppressed	No										
Advanced											
Formulation	Program Controlled										
Detection Method	Program Controlled										
Penetration Tolerance	Program Controlled										
Elastic Slip Tolerance	Program Controlled										
Normal Stiffness	Program Controlled										
Update Stiffness	Program Controlled										
Pinball Region	Program Controlled										
Geometric Modification											
Contact Geometry Correction	None										
Target Geometry Correction	None										

TABLE 11
Model (B4) > Connections > Contacts > Contact Regions

Object Name	*Contact Region 23*	*Contact Region 24*	*Contact Region 25*	*Contact Region 26*	*Contact Region 27*	*Contact Region 28*	*Contact Region 29*	*Contact Region 30*	*Contact Region 31*	*Contact Region 32*	*Contact Region 33*
State	Suppressed									Fully Defined	
Scope											
Scoping Method	Geometry Selection										

Contact	No Selection								2 Faces	
Target	No Selection		1 Face	No Selection			1 Face		2 Faces	
Contact Bodies	Part 16			Part 17	Part 18	Part 19	Part 20	Part 21	Part 22	Part 23
Target Bodies	Part 19	Part 22	Part 27	Part 20	Part 21	Part 22	Part 27		Part 24	Part 25
Definition										
Type	Bonded									
Scope Mode	Automatic									
Behavior	Program Controlled									
Trim Contact	Program Controlled									
Trim Tolerance	2.5847e-003 m									
Suppressed	No									
Advanced										
Formulation	Program Controlled									
Detection Method	Program Controlled									
Penetration Tolerance	Program Controlled									
Elastic Slip Tolerance	Program Controlled									
Normal Stiffness	Program Controlled									
Update Stiffness	Program Controlled									
Pinball Region	Program Controlled									
Geometric Modification										
Contact Geometry Correction	None									
Target Geometry Correction	None									

TABLE 12
Model (B4) > Connections > Contacts > Contact Regions

Object Name	*Contact Region 34*	*Contact Region 35*	*Contact Region 36*	*Contact Region 37*
State	Fully Defined			
Scope				
Scoping Method	Geometry Selection			
Contact	2 Faces			
Target	2 Faces			
Contact Bodies	Part 23	Part 24	Part 25	Part 26
Target Bodies	Part 26	Part 27		
Definition				
Type	Bonded			

Scope Mode	Automatic
Behavior	Program Controlled
Trim Contact	Program Controlled
Trim Tolerance	2.5847e-003 m
Suppressed	No
Advanced	
Formulation	Program Controlled
Detection Method	Program Controlled
Penetration Tolerance	Program Controlled
Elastic Slip Tolerance	Program Controlled
Normal Stiffness	Program Controlled
Update Stiffness	Program Controlled
Pinball Region	Program Controlled
Geometric Modification	
Contact Geometry Correction	None
Target Geometry Correction	None

Mesh

TABLE 13
Model (B4) > Mesh

Object Name	*Mesh*
State	Solved
Display	
Display Style	Body Color
Defaults	
Physics Preference	Mechanical
Relevance	0
Element Order	Program Controlled
Sizing	
Size Function	Adaptive
Relevance Center	Coarse
Element Size	Default
Initial Size Seed	Assembly
Transition	Fast
Span Angle Center	Fine
Automatic Mesh Based Defeaturing	On
Defeature Size	Default
Minimum Edge Length	2.6391e-005 m
Quality	
Check Mesh Quality	Yes, Errors
Error Limits	Standard Mechanical
Target Quality	Default (0.050000)
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
View Advanced Options	No
Advanced	
Number of CPUs for Parallel Part Meshing	Program Controlled
Straight Sided Elements	No
Number of Retries	Default (4)
Rigid Body Behavior	Dimensionally Reduced
Mesh Morphing	Disabled
Triangle Surface Mesher	Program Controlled
Topology Checking	No
Pinch Tolerance	Please Define
Generate Pinch on Refresh	No
Statistics	
Nodes	56793
Elements	11562

Named Selections

TABLE 14
Model (B4) > Named Selections > Named Selections

Object Name	*Selection*
State	Fully Defined
Scope	
Scoping Method	Geometry Selection
Geometry	2 Bodies
Definition	
Send to Solver	Yes
Visible	Yes
Program Controlled Inflation	Exclude
Statistics	
Type	Manual
Total Selection	2 Bodies
Suppressed	0
Used by Mesh Worksheet	No

Static Structural (B5)

TABLE 15
Model (B4) > Analysis

Object Name	*Static Structural (B5)*
State	Solved
Definition	
Physics Type	Structural
Analysis Type	Static Structural

Solver Target	Mechanical APDL
Options	
Environment Temperature	22. °C
Generate Input Only	No

TABLE 16
Model (B4) > Static Structural (B5) > Analysis Settings

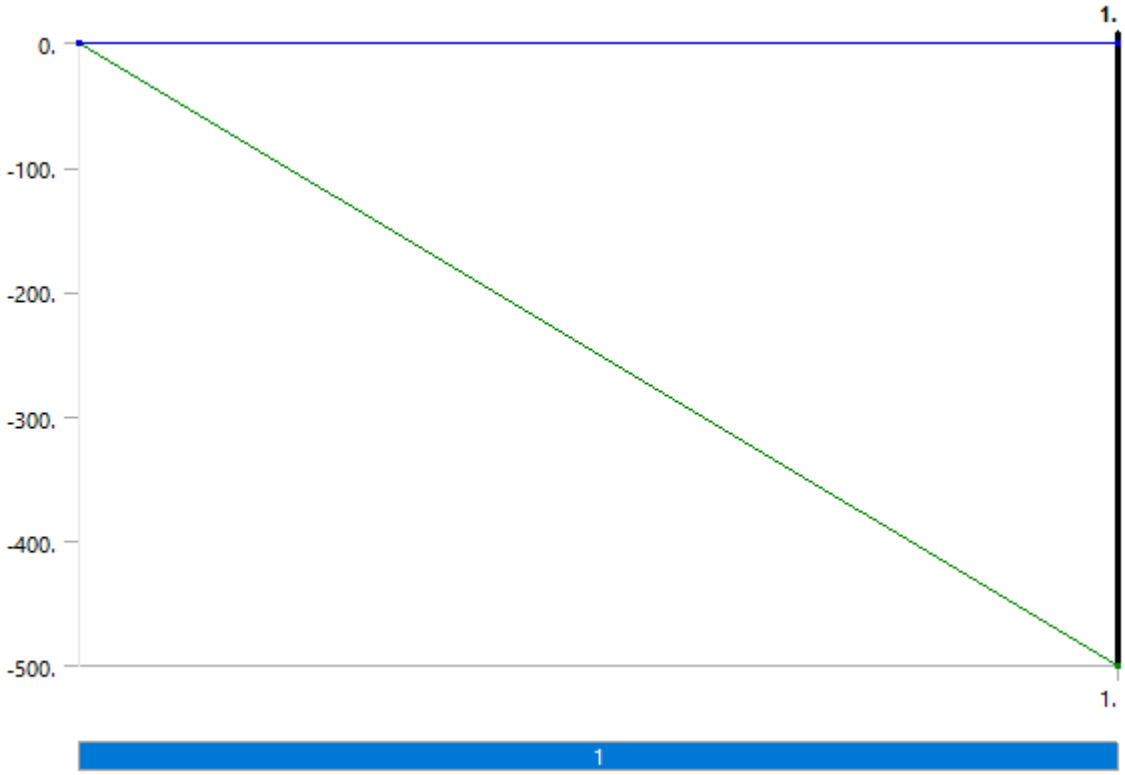
Object Name	*Analysis Settings*
State	Fully Defined
Step Controls	
Number Of Steps	1.
Current Step Number	1.
Step End Time	1. s
Auto Time Stepping	Program Controlled
Solver Controls	
Solver Type	Program Controlled
Weak Springs	Off
Solver Pivot Checking	Program Controlled
Large Deflection	Off
Inertia Relief	Off
Rotordynamics Controls	
Coriolis Effect	Off
Restart Controls	
Generate Restart Points	Program Controlled
Retain Files After Full Solve	No
Combined 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	Off
Output Controls	
Stress	Yes
Strain	Yes
Nodal Forces	No

Contact Miscellaneous	No
General Miscellaneous	No
Store Results At	All Time Points
Analysis Data Management	
Solver Files Directory	C:\Users\cesar\AppData\Local\Temp\WB_DESKTOP-GVS6OPA_cesar_1248_2\unsaved_project_files\dp0\SYS\MECH\
Future Analysis	None
Scratch Solver Files Directory	
Save MAPDL db	No
Delete Unneeded Files	Yes
Nonlinear Solution	No
Solver Units	Active System
Solver Unit System	mks

TABLE 17
Model (B4) > Static Structural (B5) > Loads

Object Name	*Fixed Support*	*Force*
State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Geometry	1 Face	4 Faces
Definition		
Type	Fixed Support	Force
Suppressed	No	
Define By		Components
Coordinate System		Global Coordinate System
X Component		0. N (ramped)
Y Component		-500. N (ramped)
Z Component		0. N (ramped)

FIGURE 1
Model (B4) > Static Structural (B5) > Force



Solution (B6)

TABLE 18
Model (B4) > Static Structural (B5) > Solution

Object Name	*Solution (B6)*
State	Solved
Adaptive Mesh Refinement	
Max Refinement Loops	1.
Refinement Depth	2.
Information	
Status	Done
MAPDL Elapsed Time	13. s
MAPDL Memory Used	275. MB
MAPDL Result File Size	17.75 MB
Post Processing	
Beam Section Results	No

TABLE 19
Model (B4) > Static Structural (B5) > Solution (B6) > 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 20
Model (B4) > Static Structural (B5) > Solution (B6) > Results

Object Name	*Total Deformation*	*Equivalent Elastic Strain*	*Equivalent Stress*	*Strain Energy*
State	Solved			
Scope				
Scoping Method	Geometry Selection			
Geometry	4 Faces	All Bodies		
Definition				
Type	Total Deformation	Equivalent Elastic Strain	Equivalent (von-Mises) Stress	Strain Energy
By	Time			
Display Time	Last			
Calculate Time History	Yes			
Identifier				
Suppressed	No			
Results				
Minimum	2.5212e-004 m	2.4337e-012 m/m	2.4524e-003 Pa	4.523e-021 J
Maximum	6.4952e-004 m	5.3881e-003 m/m	2.1594e+007 Pa	3.0093e-004 J
Minimum Occurs On	Part 27	Part 23		
Maximum Occurs On	Part 27		Part 26	Part 23
Information				
Time	1. s			
Load Step	1			
Substep	1			
Iteration Number	1			
Integration Point Results				
Display Option		Averaged		
Average Across Bodies		No		

FIGURE 2
Model (B4) > Static Structural (B5) > Solution (B6) > Total Deformation

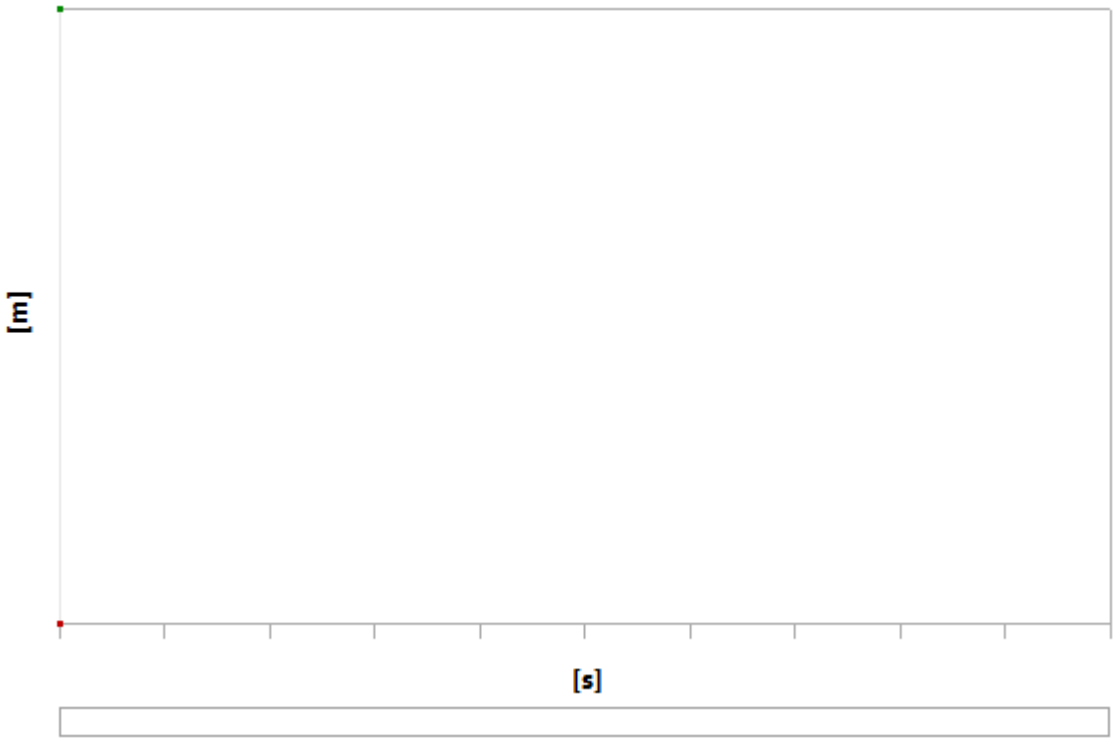


TABLE 21
Model (B4) > Static Structural (B5) > Solution (B6) > Total Deformation

Time [s]	Minimum [m]	Maximum [m]
1.	2.5212e-004	6.4952e-004

FIGURE 3
Model (B4) > Static Structural (B5) > Solution (B6) > Total Deformation > Image

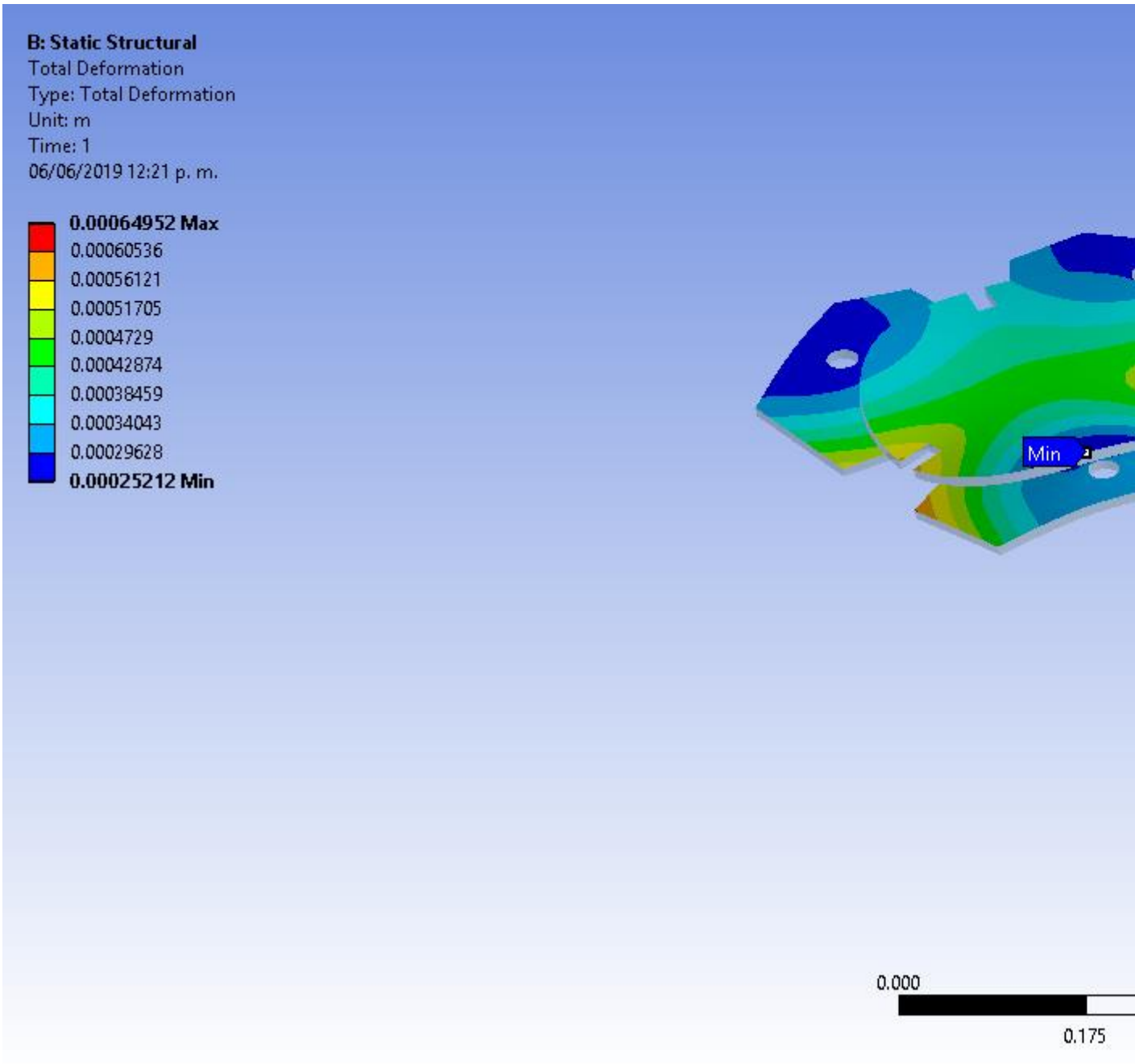


FIGURE 4
Model (B4) > Static Structural (B5) > Solution (B6) > Equivalent Elastic Strain

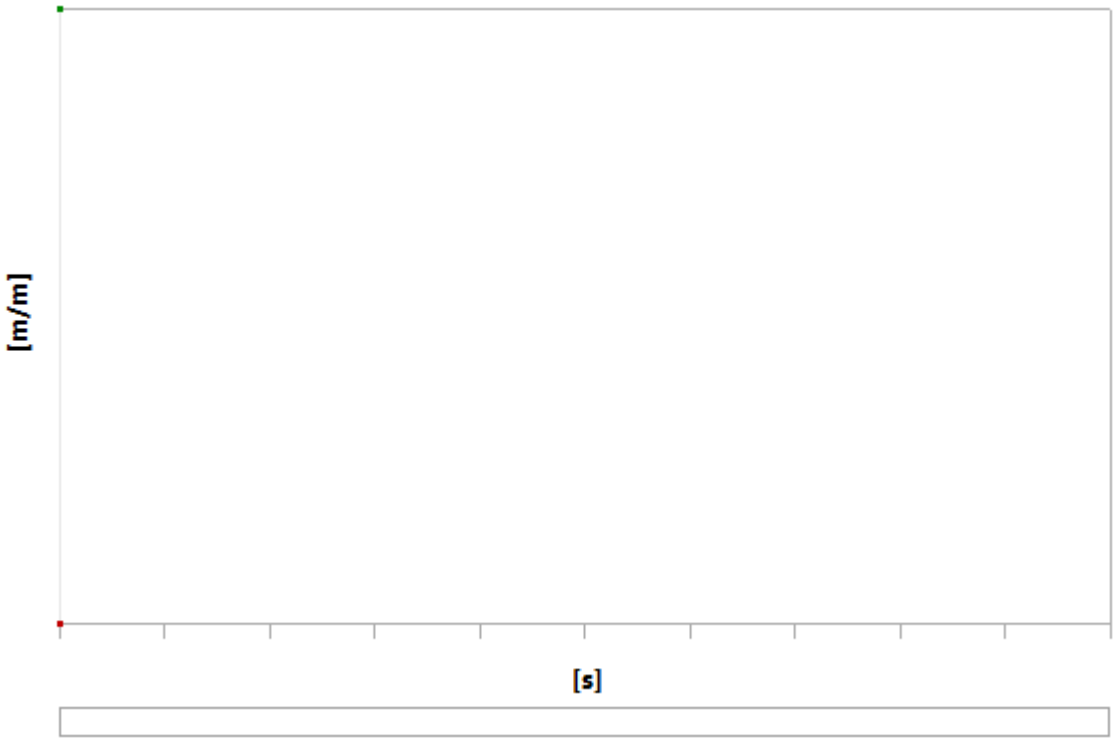


TABLE 22
Model (B4) > Static Structural (B5) > Solution (B6) > Equivalent Elastic Strain

Time [s]	Minimum [m/m]	Maximum [m/m]
1.	2.4337e-012	5.3881e-003

FIGURE 5
Model (B4) > Static Structural (B5) > Solution (B6) > Equivalent Elastic Strain > Image

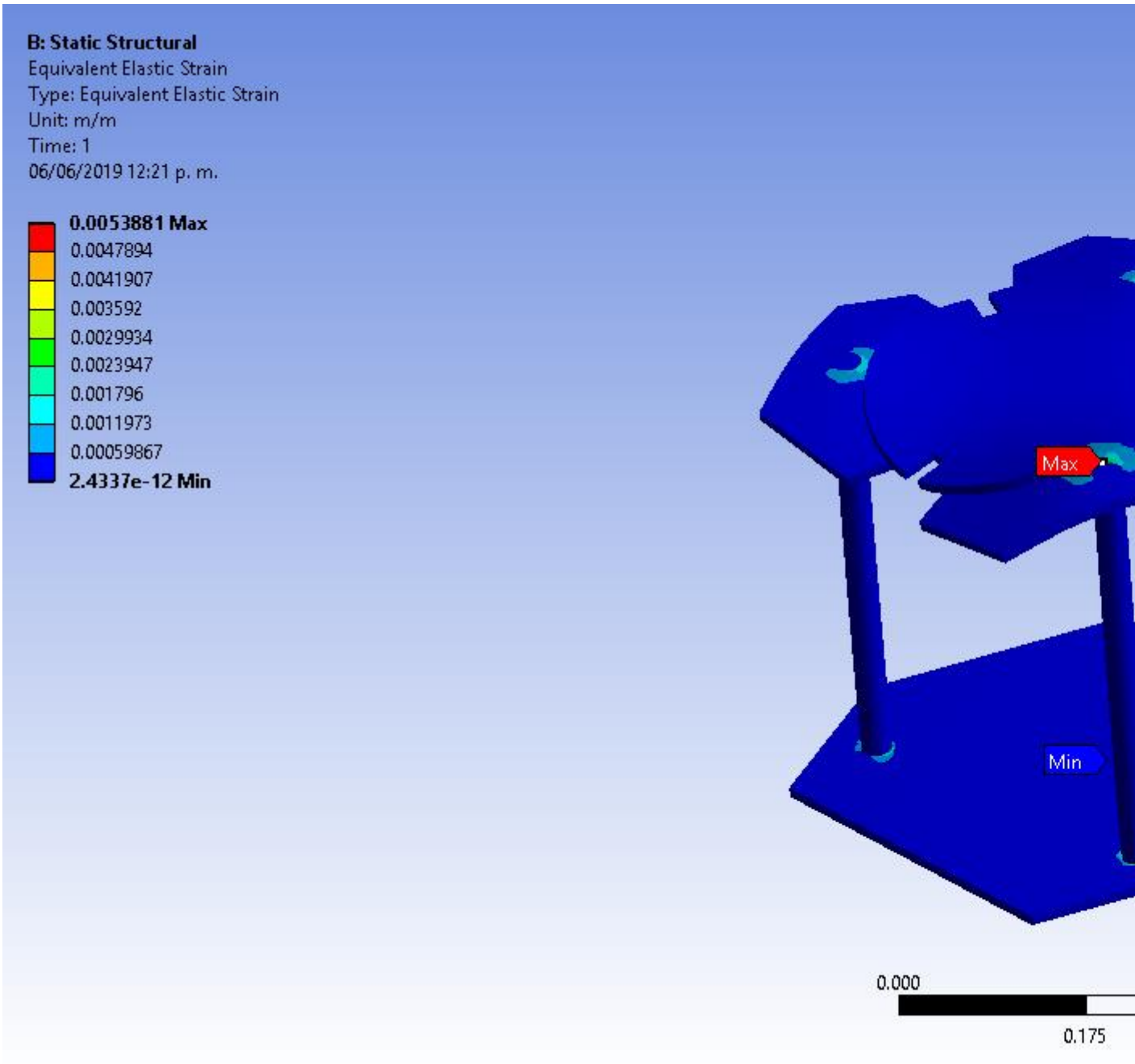


FIGURE 6
Model (B4) > Static Structural (B5) > Solution (B6) > Equivalent Stress

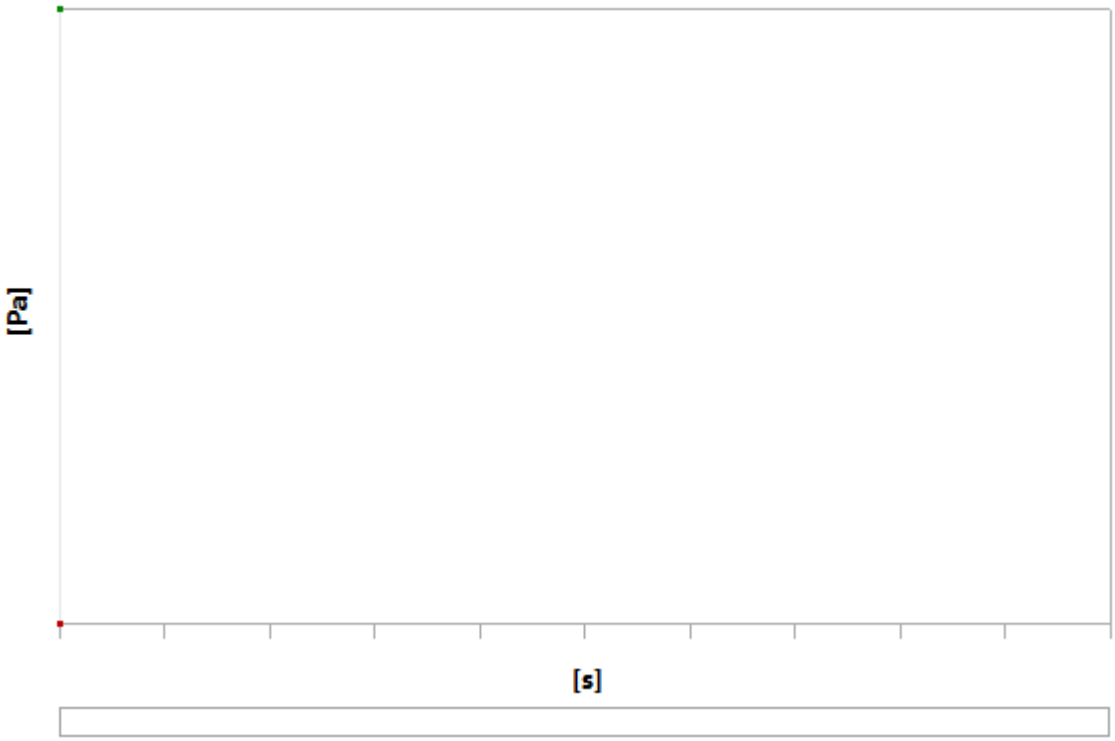


TABLE 23
Model (B4) > Static Structural (B5) > Solution (B6) > Equivalent Stress

Time [s]	Minimum [Pa]	Maximum [Pa]
1.	2.4524e-003	2.1594e+007

FIGURE 7
Model (B4) > Static Structural (B5) > Solution (B6) > Equivalent Stress > Image

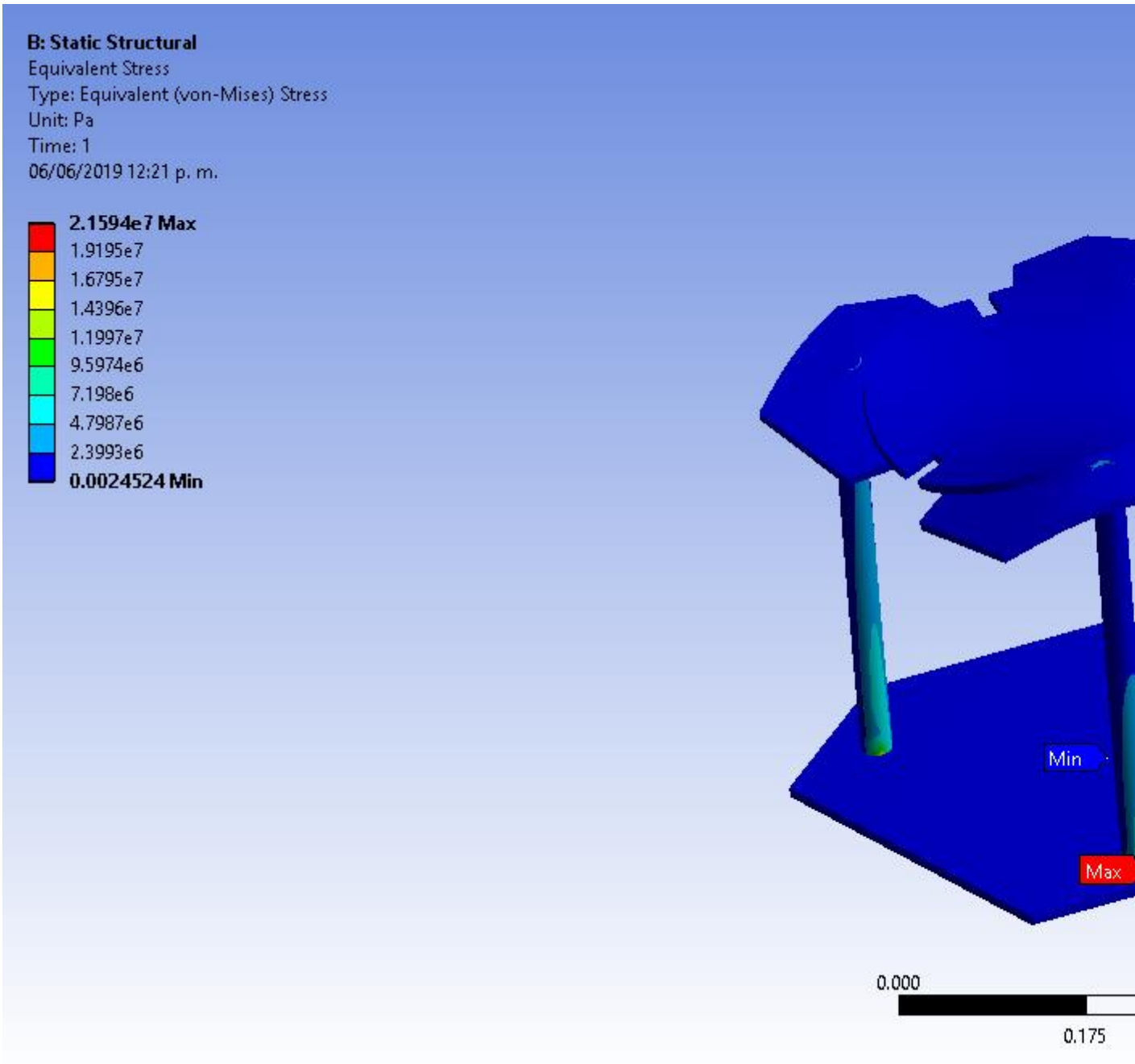


FIGURE 8
Model (B4) > Static Structural (B5) > Solution (B6) > Strain Energy

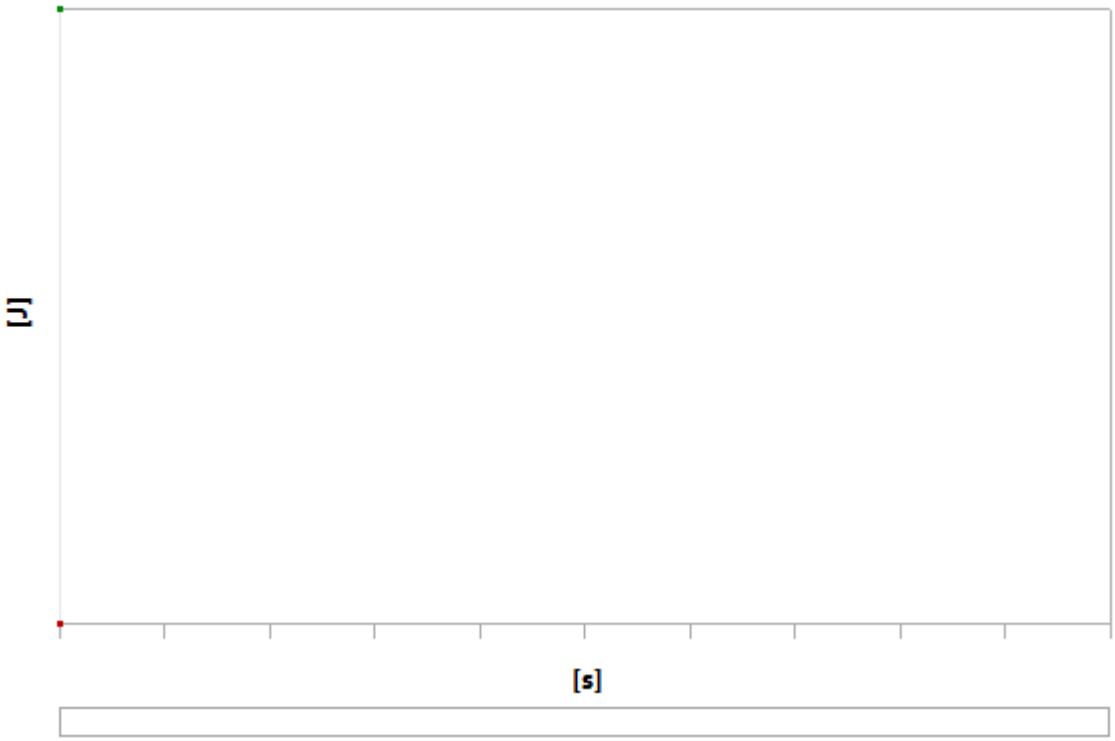
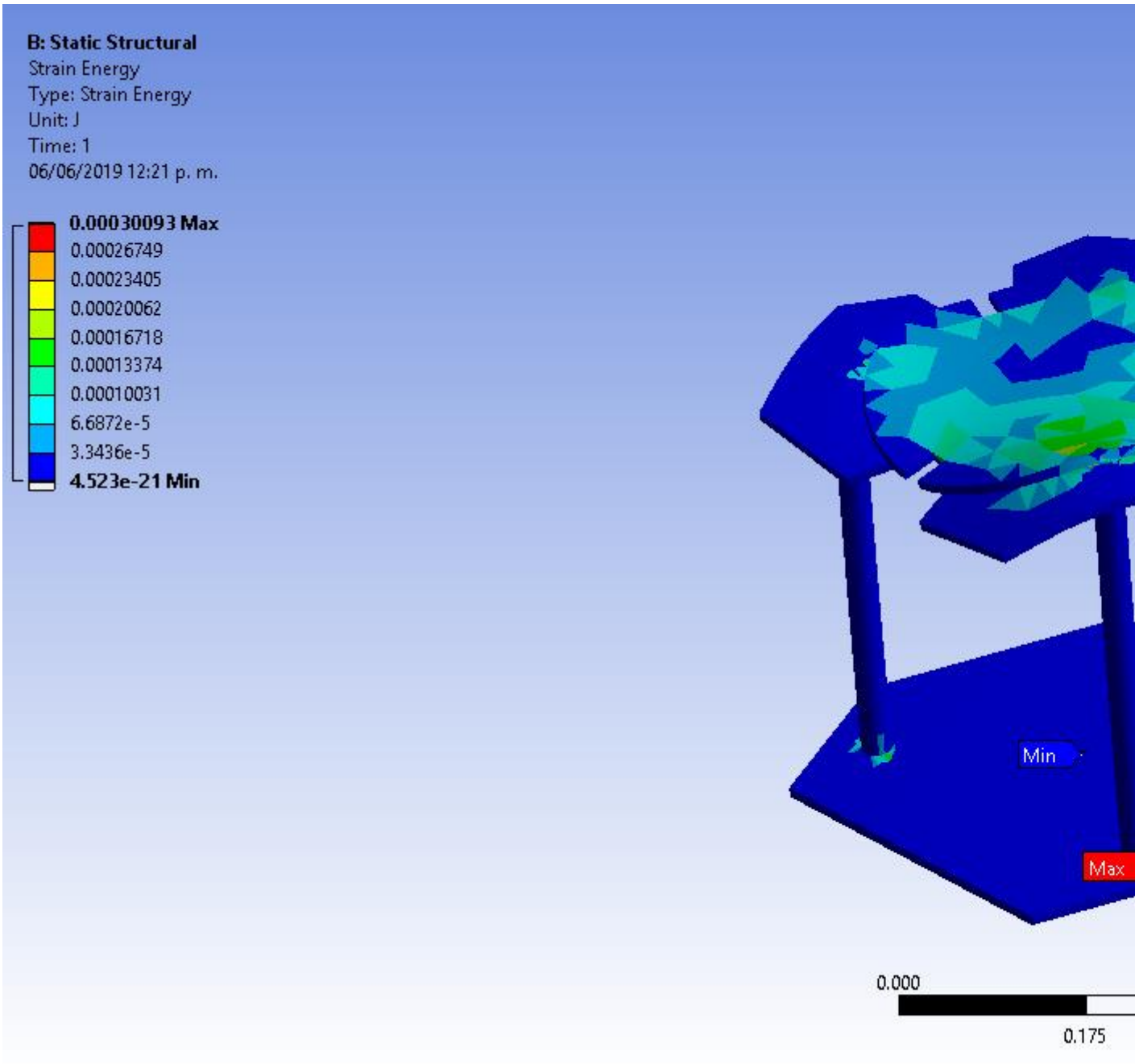


TABLE 24
Model (B4) > Static Structural (B5) > Solution (B6) > Strain Energy

Time [s]	Minimum [J]	Maximum [J]
1.	4.523e-021	3.0093e-004

FIGURE 9
Model (B4) > Static Structural (B5) > Solution (B6) > Strain Energy > Image



Material Data

Structural Steel

TABLE 25
Structural Steel > Constants

Density	7850 kg m^-3
Isotropic Secant Coefficient of Thermal Expansion	1.2e-005 C^-1
Specific Heat	434 J kg^-1 C^-1

Isotropic Thermal Conductivity	60.5 W m^-1 C^-1
Isotropic Resistivity	1.7e-007 ohm m

TABLE 26
Structural Steel > Appearance

Red	Green	Blue
132	139	179

TABLE 27
Structural Steel > Compressive Ultimate Strength

Compressive Ultimate Strength Pa
0

TABLE 28
Structural Steel > Compressive Yield Strength

Compressive Yield Strength Pa
2.5e+008

TABLE 29
Structural Steel > Tensile Yield Strength

Tensile Yield Strength Pa
2.5e+008

TABLE 30
Structural Steel > Tensile Ultimate Strength

Tensile Ultimate Strength Pa
4.6e+008

TABLE 31
Structural Steel > Isotropic Secant Coefficient of Thermal Expansion

Zero-Thermal-Strain Reference Temperature C
22

TABLE 32
Structural Steel > Alternating Stress Mean Stress

Alternating Stress Pa	Cycles	Mean Stress Pa
3.999e+009	10	0
2.827e+009	20	0
1.896e+009	50	0
1.413e+009	100	0
1.069e+009	200	0
4.41e+008	2000	0
2.62e+008	10000	0
2.14e+008	20000	0
1.38e+008	1.e+005	0
1.14e+008	2.e+005	0
8.62e+007	1.e+006	0

TABLE 33
Structural Steel > Strain-Life Parameters

Strength Coefficient Pa	Strength Exponent	Ductility Coefficient	Ductility Exponent	Cyclic Strength Coefficient Pa	Cyclic Strain Hardening Exponent
9.2e+008	-0.106	0.213	-0.47	1.e+009	0.2

TABLE 34
Structural Steel > Isotropic Elasticity

Temperature C	Young's Modulus Pa	Poisson's Ratio	Bulk Modulus Pa	Shear Modulus Pa
	2.e+011	0.3	1.6667e+011	7.6923e+010

TABLE 35
Structural Steel > Isotropic Relative Permeability

Relative Permeability
10000

Polyethylene

TABLE 36
Polyethylene > Constants

Density	950 kg m^-3
Isotropic Secant Coefficient of Thermal Expansion	2.3e-004 C^-1
Specific Heat	2300 J kg^-1 C^-1
Isotropic Thermal Conductivity	0.28 W m^-1 C^-1

TABLE 37
Polyethylene > Appearance

Red	Green	Blue
130	154	176

TABLE 38
Polyethylene > Compressive Ultimate Strength

Compressive Ultimate Strength Pa
0

TABLE 39
Polyethylene > Compressive Yield Strength

Compressive Yield Strength Pa
0

TABLE 40
Polyethylene > Tensile Yield Strength

Tensile Yield Strength Pa
2.5e+007

TABLE 41
Polyethylene > Tensile Ultimate Strength

Tensile Ultimate Strength Pa
3.3e+007

TABLE 42
Polyethylene > Isotropic Secant Coefficient of Thermal Expansion

Zero-Thermal-Strain Reference Temperature C
22

TABLE 43
Polyethylene > Isotropic Elasticity

Temperature C	Young's Modulus Pa	Poisson's Ratio	Bulk Modulus Pa	Shear Modulus Pa
	1.1e+009	0.42	2.2917e+009	3.8732e+008