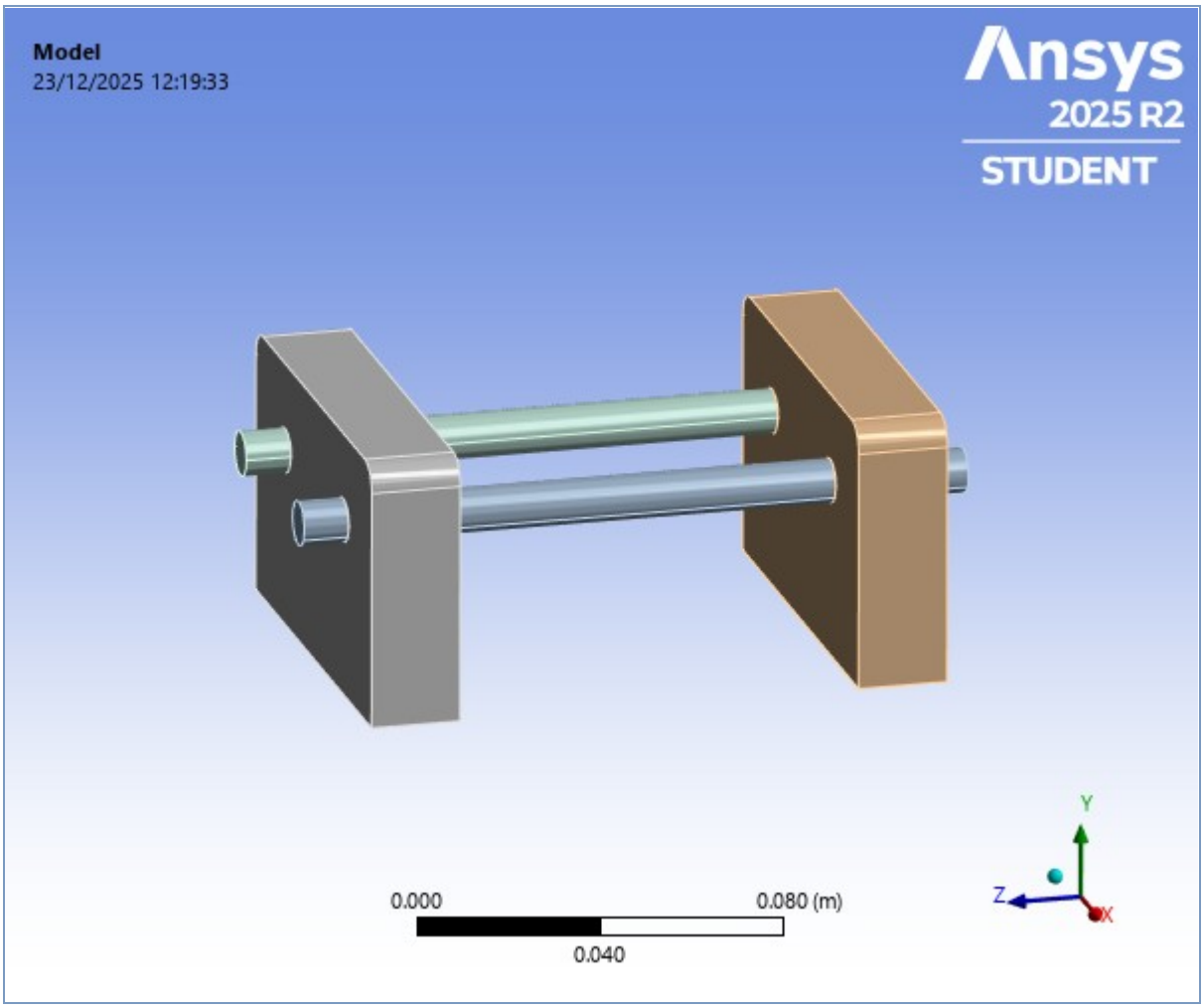
Project*

First Saved	Tuesday, March 4, 2025
Last Saved	Tuesday, December 23, 2025
Product Version	2025 R2
Save Project Before Solution	No
Save Project After Solution	No



Contents

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 (A4)

TABLE 2
Model (A4) > Geometry Imports

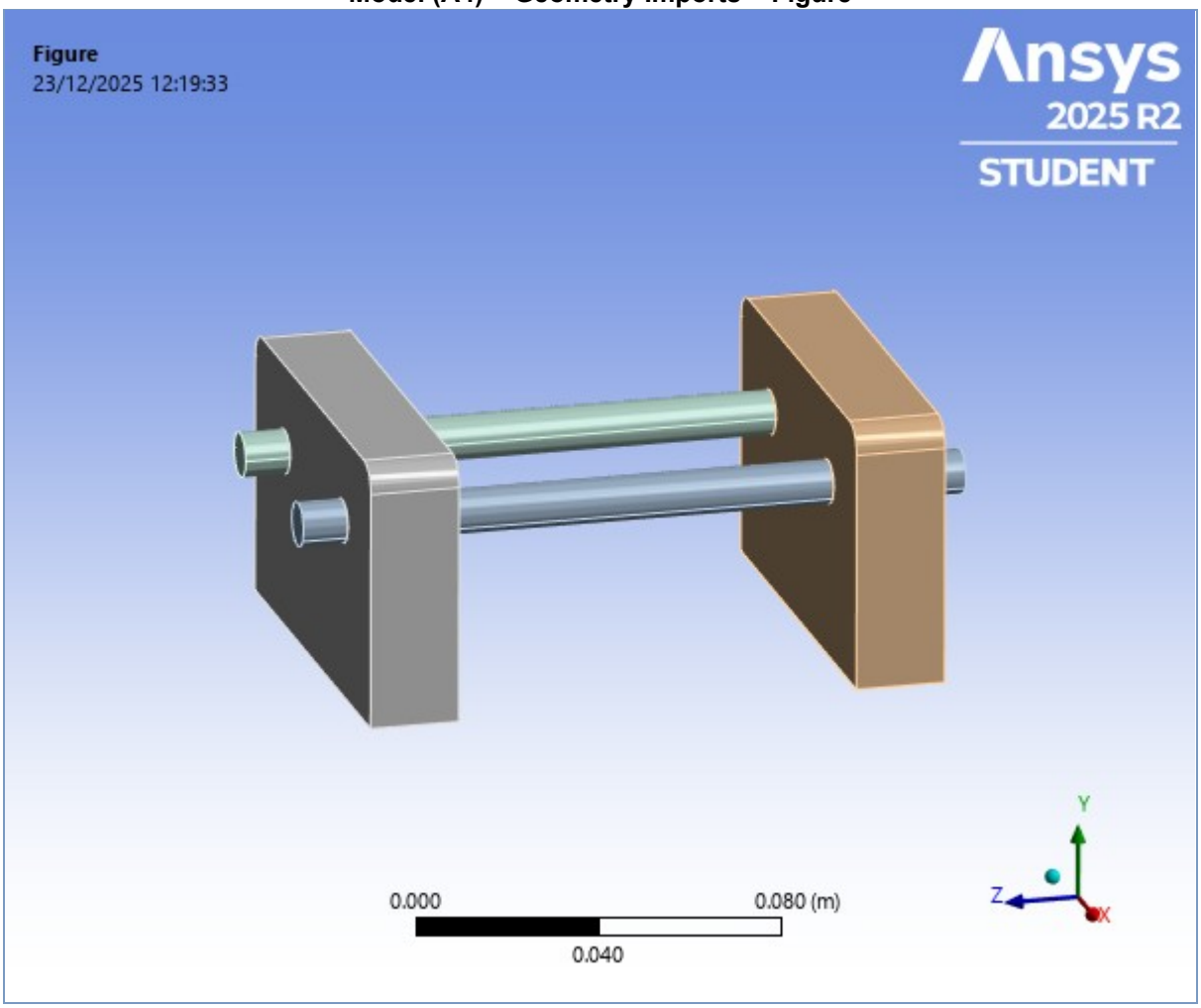
Object Name	*Geometry Imports*
State	Solved

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

Object Name	*Geometry Import (A3)*
State	Solved
Definition	
Source	C:\Users\mhmd\Desktop\Ansys mechanical\Assemply ansys\Assem1.IGS
Type	Iges
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
Analysis Type	3-D
Mixed Import Resolution	None
Import Facet Quality	Source
Clean Bodies On Import	No
Stitch Surfaces On Import	Program Tolerance
Stitch Tolerance	0.0000001
Decompose Disjoint Geometry	Yes
Enclosure and Symmetry Processing	Yes

FIGURE 1
Model (A4) > Geometry Imports > Figure



Geometry

TABLE 4
Model (A4) > Geometry

Object Name	*Geometry*
State	Fully Defined
Definition	
Source	C:\Users\mhmd\Desktop\Ansys mechanical\Assemply ansys\Assem1.IGS
Type	Iges
Length Unit	Millimeters
Element Control	Program Controlled
Display Style	Body Color
Bounding Box	
Length X	0.1 m
Length Y	6.e-002 m
Length Z	0.15 m
Properties	
Volume	2.5652e-004 m³
Mass	2.0137 kg
Scale Factor Value	1.
Statistics	
Bodies	4
Active Bodies	4
Nodes	5296
Elements	1960
Mesh Metric	None
Update Options	
Assign Default Material	No
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
Analysis Type	3-D
Mixed Import Resolution	None
Import Facet Quality	Source
Clean Bodies On Import	No
Stitch Surfaces On Import	Program Tolerance
Decompose Disjoint Geometry	Yes
ID_GeometryPrefProcessPhysicsDefinition	No
Enclosure and Symmetry Processing	Yes

TABLE 5
Model (A4) > Geometry > Parts

Object Name	*Part1|Solid*	*Part2|Solid*	*Part1|Solid*	*Part2|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	Structural Steel		Structural Steel 2	Structural Steel 3
Nonlinear Effects	Yes			
Thermal Strain Effects	Yes			
Bounding Box				
Length X	0.1 m	1.3817e-002 m	0.1 m	1.e-002 m
Length Y	6.e-002 m	1.3817e-002 m	6.e-002 m	1.e-002 m
Length Z	2.e-002 m	0.15 m	2.e-002 m	0.15 m
Properties				
Volume	1.1655e-004 m³	1.1705e-005 m³	1.1655e-004 m³	1.1705e-005 m³
Mass	0.91494 kg	9.1888e-002 kg	0.91494 kg	9.1888e-002 kg
Centroid X	1.3318e-018 m	2.5e-002 m	1.3318e-018 m	-2.5e-002 m
Centroid Y	-3.4553e-004 m	1.e-002 m	-3.4553e-004 m	1.e-002 m
Centroid Z	1.e-002 m	-4.5e-002 m	-0.1 m	-4.5e-002 m
Moment of Inertia Ip1	3.0837e-004 kg·m²	1.7286e-004 kg·m²	3.0837e-004 kg·m²	1.7286e-004 kg·m²
Moment of Inertia Ip2	7.9418e-004 kg·m²	1.7286e-004 kg·m²	7.9418e-004 kg·m²	1.7286e-004 kg·m²
Moment of Inertia Ip3	1.0415e-003 kg·m²	1.1412e-006 kg·m²	1.0415e-003 kg·m²	1.1412e-006 kg·m²
Statistics				
Nodes	1562	1086	1562	1086
Elements	782	198	782	198
Mesh Metric	None			

TABLE 6
Model (A4) > Materials

Object Name	*Materials*
State	Fully Defined
Statistics	
Materials	3
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. 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.]
Transfer Properties	
Source	
Read Only	No

Connections

TABLE 8
Model (A4) > Connections

Object Name	*Connections*
State	Fully Defined
Auto Detection	
Generate Automatic Connection On Refresh	Yes
Transparency	
Enabled	Yes
Statistics	
Contacts	4
Active Contacts	4
Joints	0
Active Joints	0
Beams	0
Active Beams	0
Bearings	0
Active Bearings	0
Springs	0
Active Springs	0
Body Interactions	0
Active Body Interactions	0

TABLE 9
Model (A4) > 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	4.75e-004 m
Use Range	No
Face/Face	Yes
Face-Face Angle Tolerance	75. °
Face Overlap Tolerance	Off
Cylindrical Faces	Include
Face/Edge	No
Edge/Edge	No
Priority	Include All
Group By	Bodies
Search Across	Bodies
Statistics	
Connections	4
Active Connections	4

TABLE 10
Model (A4) > Connections > Contacts > Contact Regions

Object Name	*Contact Region 3*	*Contact Region 4*	*Contact Region 5*	*Contact Region 6*
State	Fully Defined			
Scope				
Scoping Method	Geometry Selection			
Contact	2 Faces			
Target	2 Faces			
Contact Bodies	Part1|Solid		Part2|Solid	Part1|Solid
Target Bodies	Part2|Solid		Part1|Solid	Part2|Solid
Protected	No			
Definition				
Type	Bonded			
Scope Mode	Automatic			
Behavior	Program Controlled			
Trim Contact	Program Controlled			
Trim Tolerance	4.75e-004 m			
Contact APDL Name				
Target APDL Name				
Suppressed	No			
Display				
Element Normals	No			
Advanced				
Formulation	Program Controlled			
Small Sliding	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 11
Model (A4) > Mesh

Object Name	*Mesh*
State	Solved
Display	
Display Style	Use Geometry Setting
Defaults	
Physics Preference	Mechanical
Element Order	Program Controlled
Element Size	Default
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	0.19 m

Average Surface Area	1.5043e-003 m²
Minimum Edge Length	9.4248e-003 m
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
Auto-Map Fillets	No
Automatic Methods	
Sheet Body Method	Quad Dominant
Sweepable Body Method	Sweep
Statistics	
Nodes	5296
Elements	1960
Show Detailed Statistics	No

Static Structural (A5)

TABLE 12
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 13
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

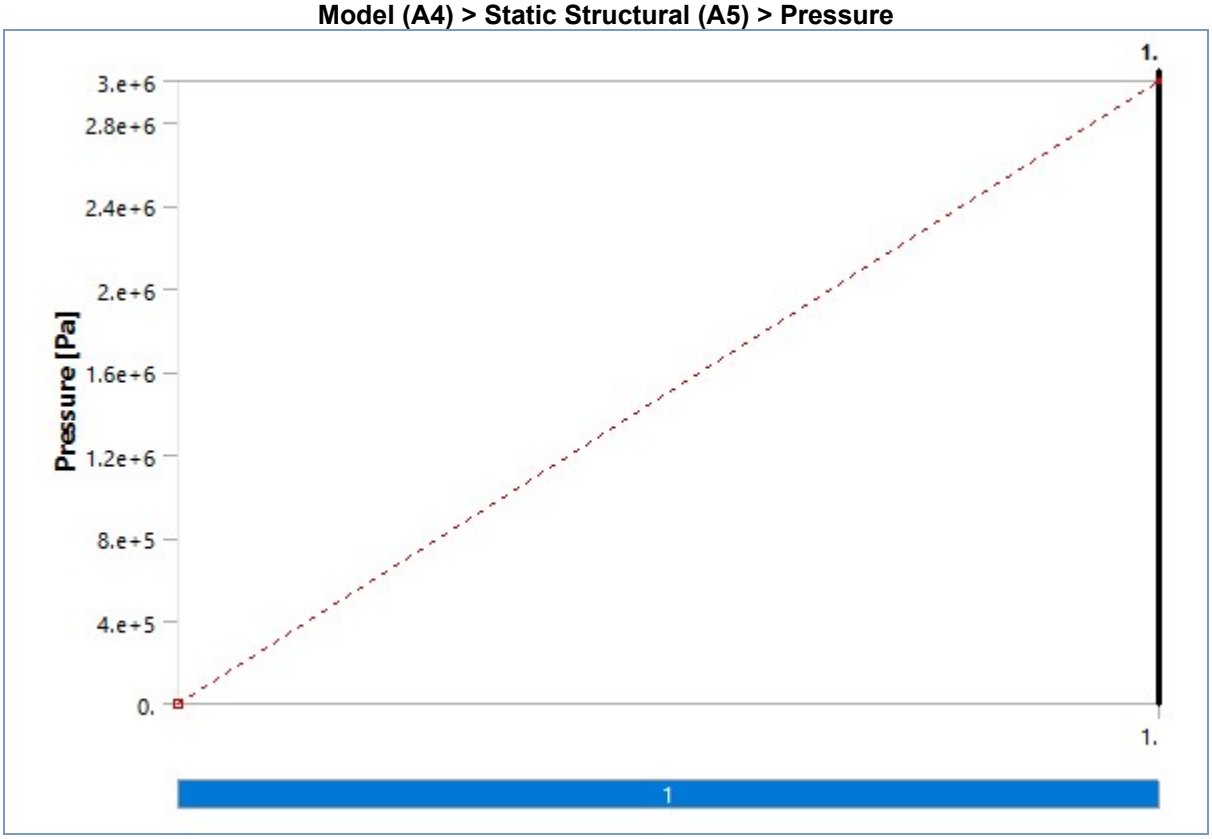
Auto Time Stepping	Program Controlled
Solver Controls	
Solver Type	Program Controlled
Weak Springs	Off
Solver Pivot Checking	Program Controlled
Large Deflection	Off
Inertia Relief	Off
Quasi-Static Solution	Off
Rotordynamics Controls	
Coriolis Effect	Off
Restart Controls	
Generate Restart Points	Program 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	
Output Selection	None
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	E:\from mhmd LAB\Ansys mechanical\Assemply ansys\ansys assemply_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	mks

TABLE 14
Model (A4) > Static Structural (A5) > Loads

Object Name	*Fixed Support*	*Fixed Support 2*	*Pressure*

State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Geometry	2 Faces	
Definition		
Type	Fixed Support	Pressure
Suppressed	No	
Define By		Normal To
Applied By		Surface Effect
Loaded Area		Deformed
Magnitude		3.e+006 Pa (ramped)

FIGURE 2
Model (A4) > Static Structural (A5) > Pressure



Solution (A6)

TABLE 15
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	4. s
MAPDL Memory Used	202. MB
MAPDL Result File Size	1.875 MB
Post Processing	
Beam Section Results	No
On Demand Stress/Strain	No

TABLE 16
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 17
Model (A4) > Static Structural (A5) > Solution (A6) > Results

Object Name	*Total Deformation*	*Equivalent Stress*
State	Solved	
Scope		
Scoping Method	Geometry Selection	
Geometry	All Bodies	
Definition		
Type	Total Deformation	Equivalent (von-Mises) Stress
By	Time	
Display Time	Last	
Separate Data by Entity	No	
Calculate Time History	Yes	
Identifier		
Suppressed	No	
Results		
Minimum	0. m	1370.8 Pa
Maximum	9.0873e-007 m	3.6541e+006 Pa
Average	2.8555e-007 m	6.0506e+005 Pa
Minimum Occurs On	Part1|Solid	
Maximum Occurs On	Part1|Solid	Part2|Solid
Information		
Time	1. s	
Load Step	1	
Substep	1	
Iteration Number	1	
Integration Point Results		
Display Option		Averaged
Average Across Bodies		No

FIGURE 3
Model (A4) > Static Structural (A5) > Solution (A6) > Total Deformation

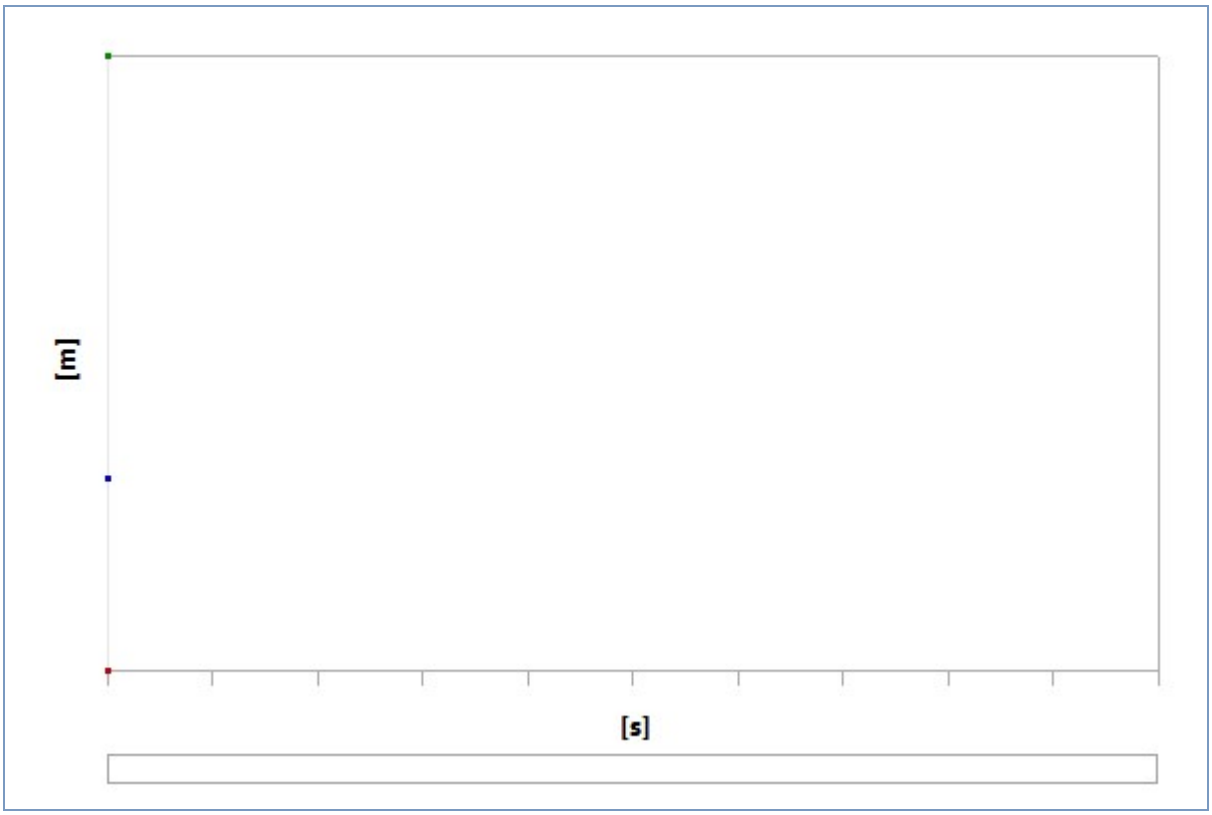


TABLE 18
Model (A4) > Static Structural (A5) > Solution (A6) > Total Deformation

Time [s]	Minimum [m]	Maximum [m]	Average [m]
1.	0.	9.0873e-007	2.8555e-007

FIGURE 4
Model (A4) > Static Structural (A5) > Solution (A6) > Total Deformation > Figure

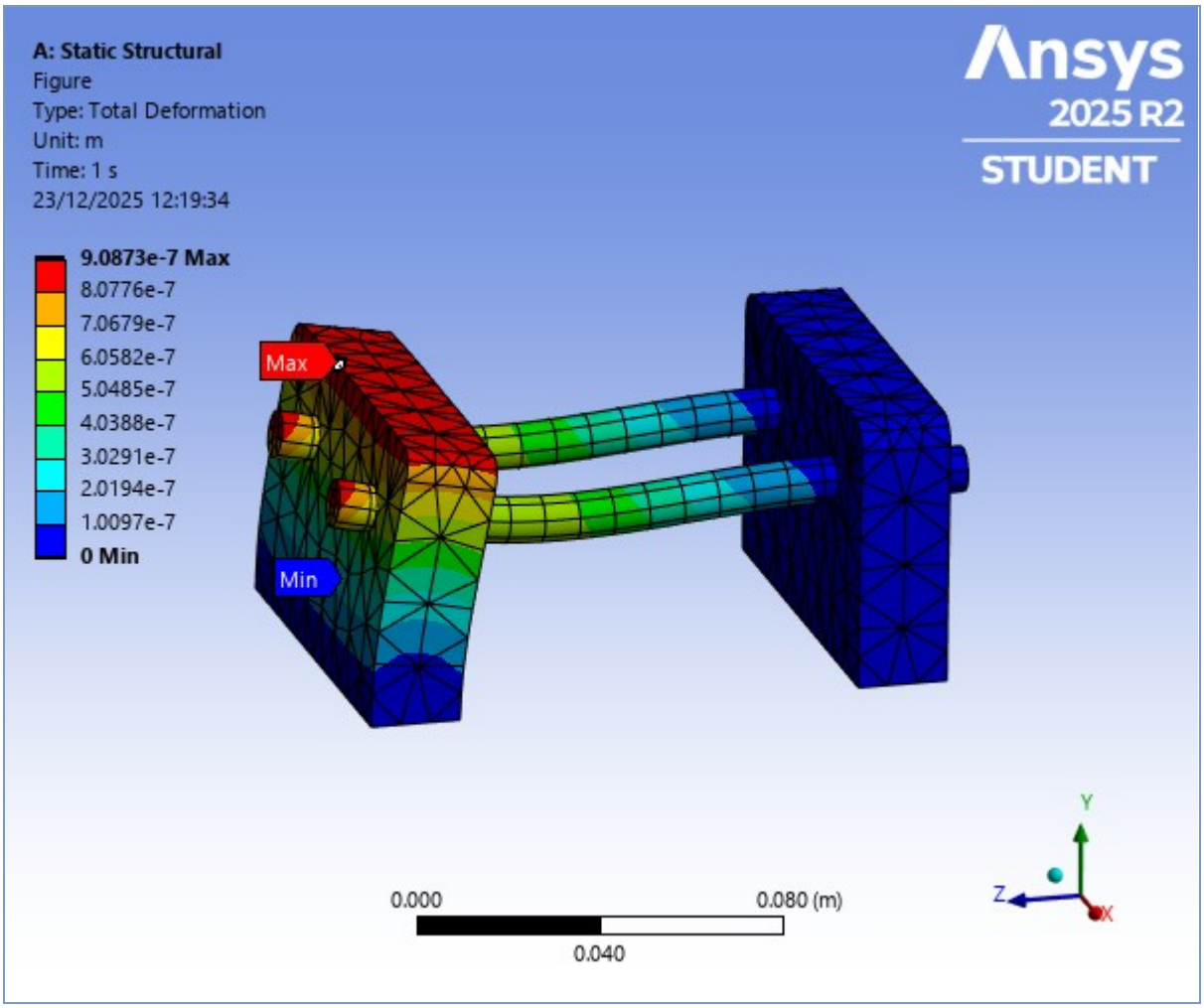


FIGURE 5
Model (A4) > Static Structural (A5) > Solution (A6) > Equivalent Stress

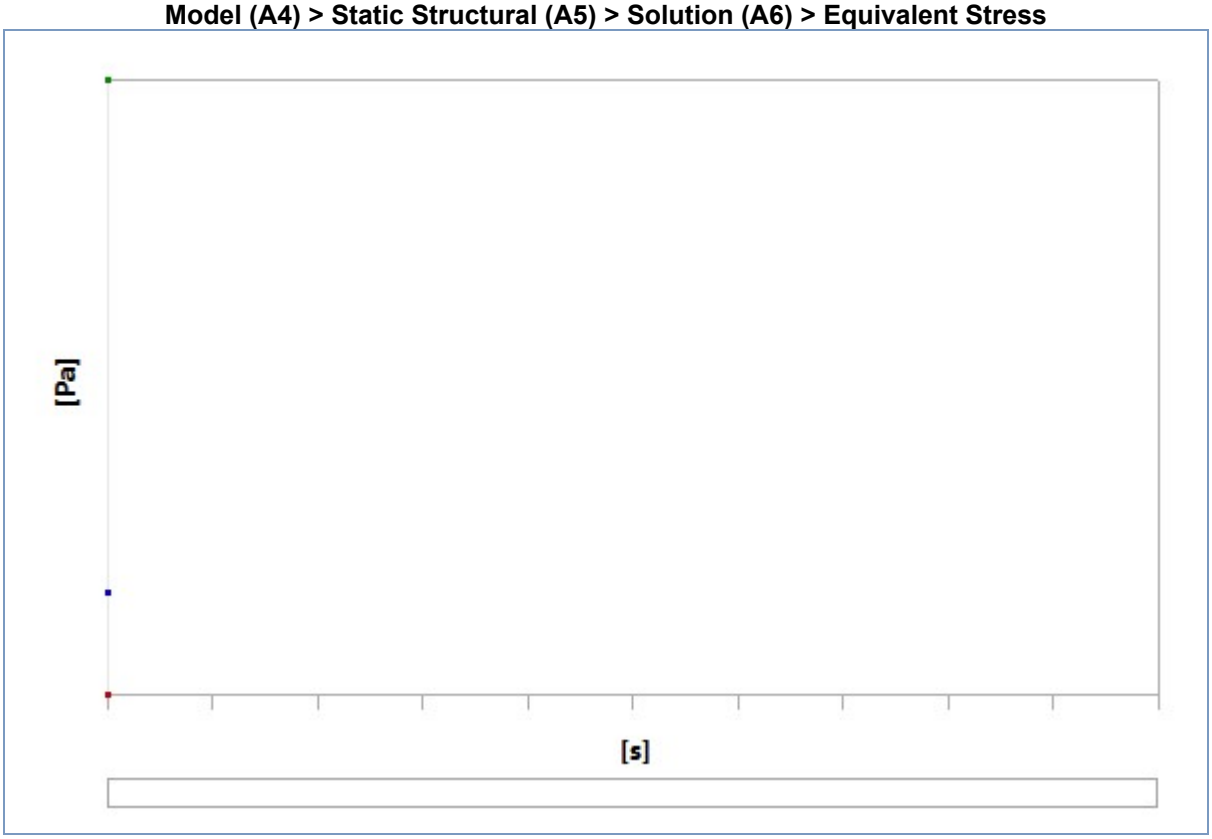


TABLE 19
Model (A4) > Static Structural (A5) > Solution (A6) > Equivalent Stress

Time [s]	Minimum [Pa]	Maximum [Pa]	Average [Pa]
1.	1370.8	3.6541e+006	6.0506e+005

FIGURE 6
Model (A4) > Static Structural (A5) > Solution (A6) > Equivalent Stress > Figure

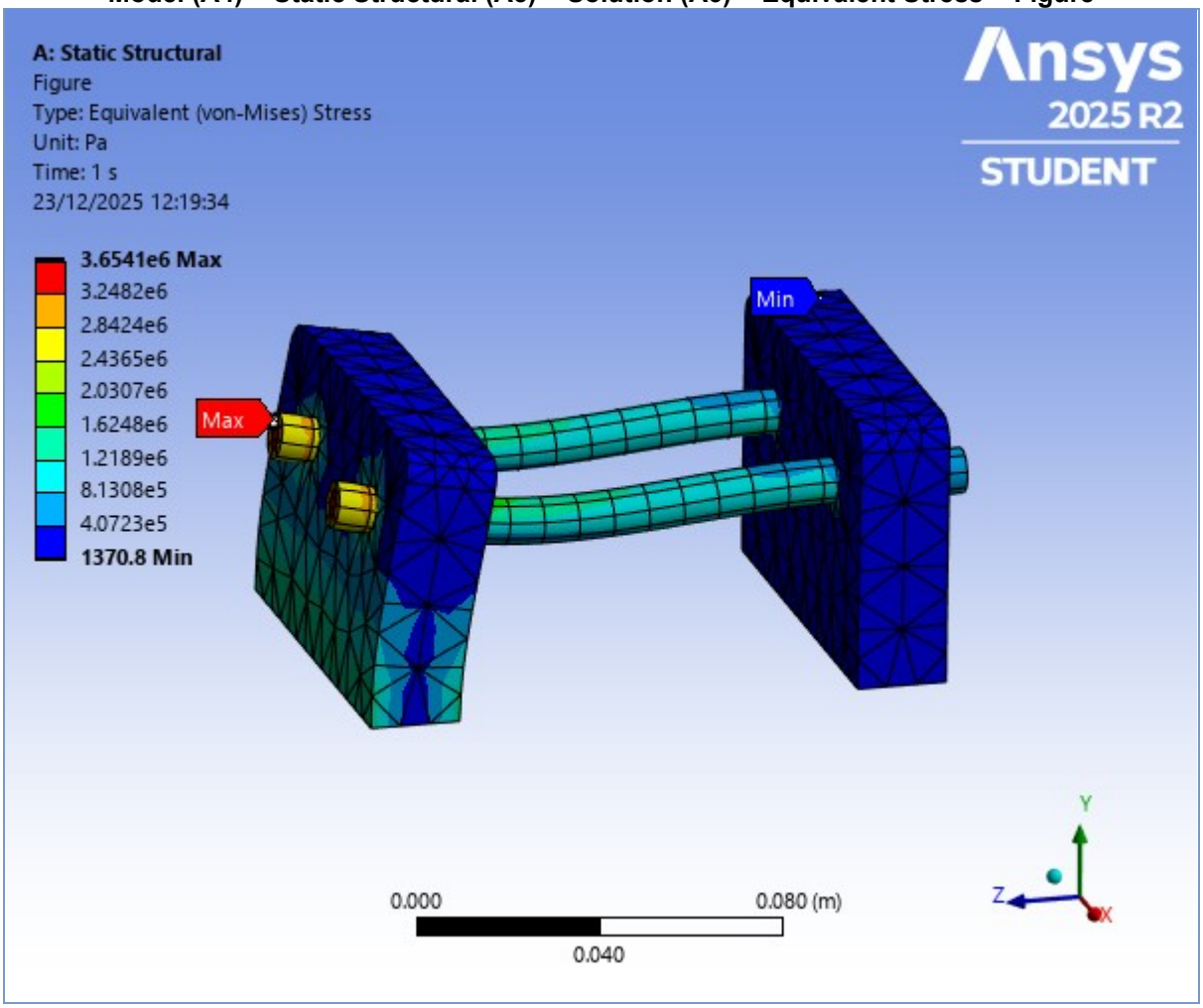


TABLE 20
Model (A4) > Static Structural (A5) > Solution (A6) > Stress Safety Tools

Object Name	*Stress Tool*
State	Solved
Definition	
Theory	Max Equivalent Stress
Stress Limit Type	Tensile Yield Per Material

TABLE 21
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	> 10
Minimum Occurs On	Part1|Solid
Information	
Time	1. s
Load Step	1
Substep	1
Iteration Number	1

FIGURE 7
Model (A4) > Static Structural (A5) > Solution (A6) > Stress Tool > Safety Factor

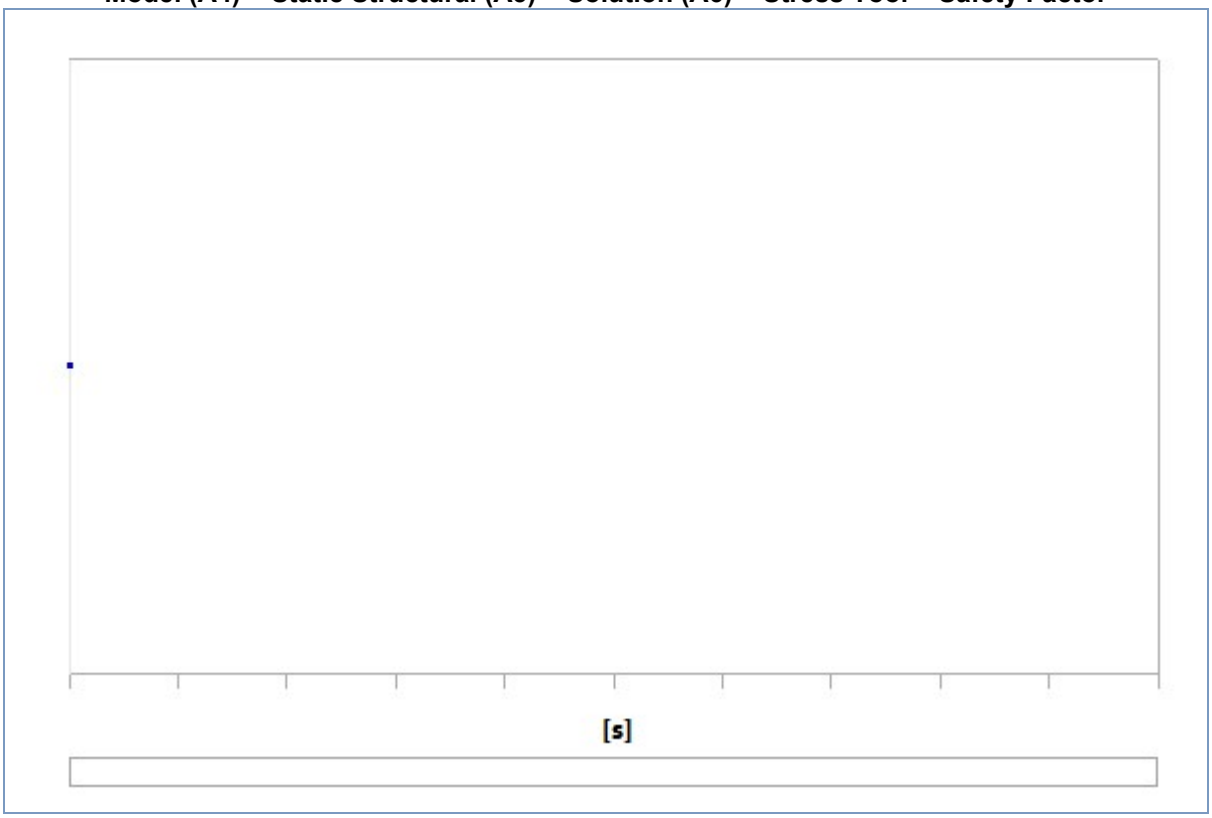
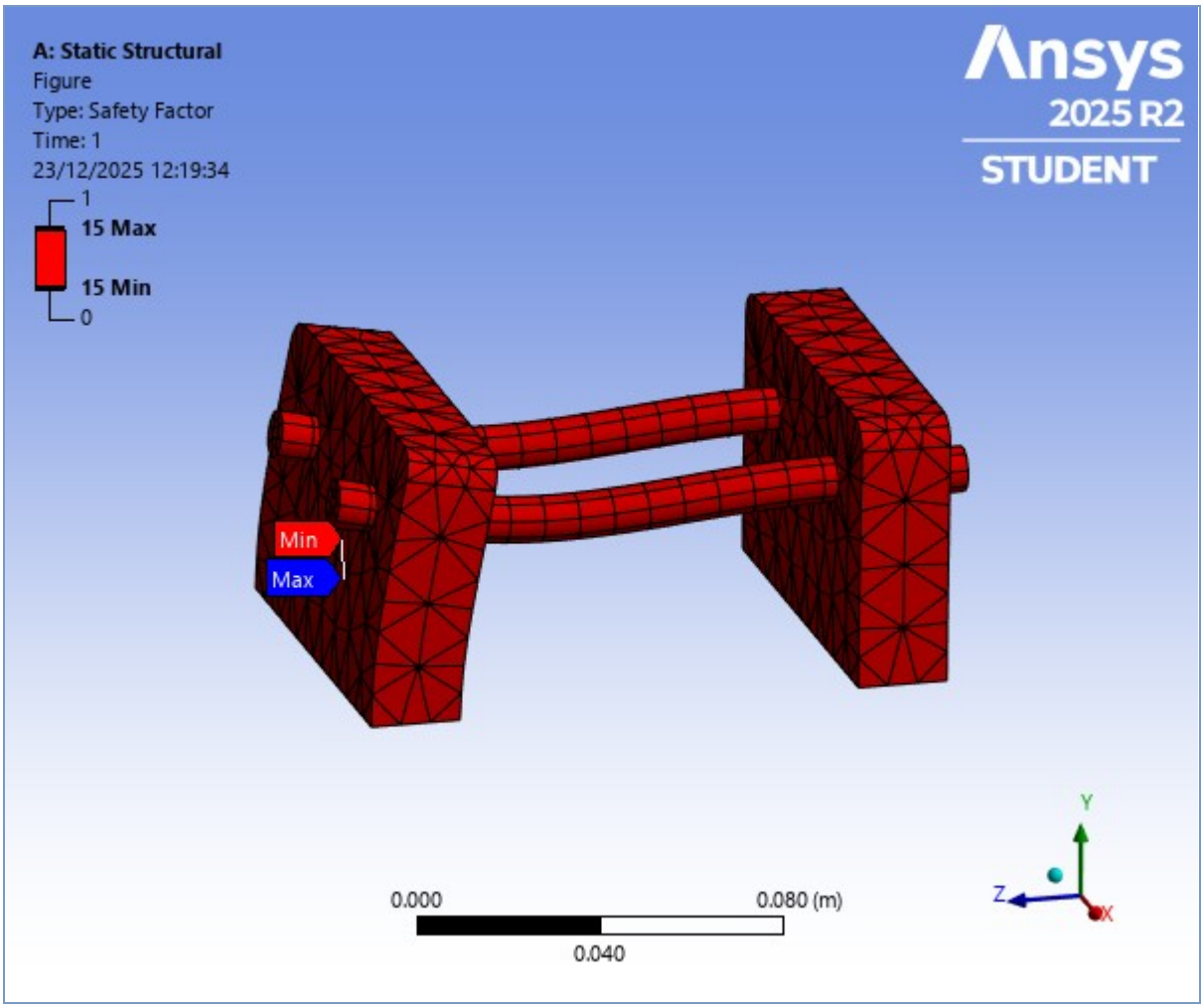


TABLE 22
Model (A4) > Static Structural (A5) > Solution (A6) > Stress Tool > Safety Factor

Time [s]	Minimum	Maximum	Average
1.	15.	15.	15.

FIGURE 8
Model (A4) > Static Structural (A5) > Solution (A6) > Stress Tool > Safety Factor > Figure



Material Data

Structural Steel

TABLE 23
Structural Steel > Constants

Density	7850 kg m^-3
Coefficient of Thermal Expansion	1.2e-005 C^-1
Specific Heat	434 J kg^-1 C^-1
Thermal Conductivity	60.5 W m^-1 C^-1
Resistivity	1.7e-007 kg m^3 A^-2 s^-3

TABLE 24
Structural Steel > Color

Red	Green	Blue
132	139	179

TABLE 25
Structural Steel > Compressive Ultimate Strength

Compressive Ultimate Strength Pa
0

TABLE 26
Structural Steel > Compressive Yield Strength

Compressive Yield Strength Pa
2.5e+008

TABLE 27
Structural Steel > Tensile Yield Strength

Tensile Yield Strength Pa
2.5e+008

TABLE 28
Structural Steel > Tensile Ultimate Strength

Tensile Ultimate Strength Pa
4.6e+008

TABLE 29
Structural Steel > Isotropic Secant Coefficient of Thermal Expansion

Zero-Thermal-Strain Reference Temperature C
22

TABLE 30
Structural Steel > S-N Curve

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 31
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 32
Structural Steel > Isotropic Elasticity

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

TABLE 33
Structural Steel > Isotropic Relative Permeability

Relative Permeability
10000

Structural Steel 2

TABLE 34
Structural Steel 2 > Constants

Density	7850 kg m^-3
Coefficient of Thermal Expansion	1.2e-005 C^-1
Specific Heat	434 J kg^-1 C^-1
Thermal Conductivity	60.5 W m^-1 C^-1
Resistivity	1.7e-007 kg m^3 A^-2 s^-3

TABLE 35

Structural Steel 2 > Color

Red	Green	Blue
132	139	179

TABLE 36
Structural Steel 2 > Compressive Ultimate Strength

Compressive Ultimate Strength Pa
0

TABLE 37
Structural Steel 2 > Compressive Yield Strength

Compressive Yield Strength Pa
2.5e+008

TABLE 38
Structural Steel 2 > Tensile Yield Strength

Tensile Yield Strength Pa
2.5e+008

TABLE 39
Structural Steel 2 > Tensile Ultimate Strength

Tensile Ultimate Strength Pa
4.6e+008

TABLE 40
Structural Steel 2 > Isotropic Secant Coefficient of Thermal Expansion

Zero-Thermal-Strain Reference Temperature C
22

TABLE 41
Structural Steel 2 > S-N Curve

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 42
Structural Steel 2 > 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 43
Structural Steel 2 > Isotropic Elasticity

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

TABLE 44
Structural Steel 2 > Isotropic Relative Permeability

Relative Permeability

10000

Structural Steel 3

TABLE 45
Structural Steel 3 > Constants

Density	7850 kg m^-3
Coefficient of Thermal Expansion	1.2e-005 C^-1
Specific Heat	434 J kg^-1 C^-1
Thermal Conductivity	60.5 W m^-1 C^-1
Resistivity	1.7e-007 kg m^3 A^-2 s^-3

TABLE 46
Structural Steel 3 > Color

Red	Green	Blue
132	139	179

TABLE 47
Structural Steel 3 > Compressive Ultimate Strength

Compressive Ultimate Strength Pa
0

TABLE 48
Structural Steel 3 > Compressive Yield Strength

Compressive Yield Strength Pa
2.5e+008

TABLE 49
Structural Steel 3 > Tensile Yield Strength

Tensile Yield Strength Pa
2.5e+008

TABLE 50
Structural Steel 3 > Tensile Ultimate Strength

Tensile Ultimate Strength Pa
4.6e+008

TABLE 51
Structural Steel 3 > Isotropic Secant Coefficient of Thermal Expansion

Zero-Thermal-Strain Reference Temperature C
22

TABLE 52
Structural Steel 3 > S-N Curve

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 53
Structural Steel 3 > 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 54
Structural Steel 3 > Isotropic Elasticity

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

TABLE 55
Structural Steel 3 > Isotropic Relative Permeability

Relative Permeability
10000