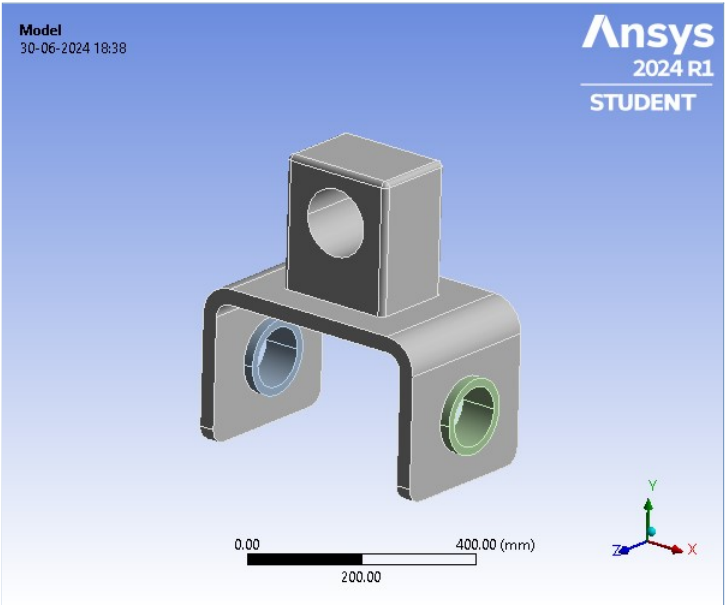




Project*

First Saved	Sunday, June 30, 2024
Last Saved	Sunday, June 30, 2024
Product Version	2024 R1
Save Project Before Solution	No
Save Project After Solution	No



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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	<i>Geometry Imports</i>
State	Solved

TABLE 3

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

Object Name	<i>Geometry Import (A3)</i>
State	Solved
Definition	
Source	D:\Downloads\vinc_aparati_asm\vinc_aparati_asm.stp
Type	Step
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	None
Decompose Disjoint Geometry	Yes
Enclosure and Symmetry Processing	Yes

Geometry

TABLE 4

Model (A4) > Geometry

Object Name	<i>Geometry</i>
State	Fully Defined
Definition	
Source	D:\Downloads\vinc_aparati_asm\vinc_aparati_asm.stp
Type	Step
Length Unit	Millimeters
Element Control	Program Controlled

Display Style	Body Color
Bounding Box	
Length X	511.74 mm
Length Y	550. mm
Length Z	300. mm
Properties	
Volume	1.5749e+007 mm ³
Mass	123.63 kg
Scale Factor Value	1.
Statistics	
Bodies	3
Active Bodies	3
Nodes	43911
Elements	21765
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	None
Decompose Disjoint Geometry	Yes
Enclosure and Symmetry Processing	Yes

TABLE 5
Model (A4) > Geometry > Parts

Object Name	SAC_PARCA SAC_PARCA	PUL PUL	PUL PUL[2]
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		
Nonlinear Effects	Yes		
Thermal Strain Effects	Yes		
Bounding Box			
Length X	471.74 mm	70. mm	
Length Y	550. mm	140. mm	
Length Z	300. mm	140. mm	
Properties			
Volume	1.4926e+007 mm³	4.1169e+005 mm³	
Mass	117.17 kg	3.2318 kg	
Centroid X	-0.23493 mm	-220.87 mm	220.87 mm
Centroid Y	309.14 mm	130. mm	
Centroid Z	0.85141 mm	-3.464e-015 mm	
Moment of Inertia Ip1	2.7825e+006 kg·mm²	12752 kg·mm²	
Moment of Inertia Ip2	2.8807e+006 kg·mm²	7695.5 kg·mm²	
Moment of Inertia Ip3	4.4097e+006 kg·mm²	7695.5 kg·mm²	
Statistics			
Nodes	36079	3916	
Elements	20565	600	
Mesh Metric	None		

TABLE 6
Model (A4) > Materials

Object Name	Materials
State	Fully Defined
Statistics	
Materials	1
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

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	2
Active Contacts	2
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	2.0223 mm
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	2
Active Connections	2

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

Object Name	Bonded - SAC_PARCA SAC_PARCA To PUL PUL		Bonded - SAC_PARCA SAC_PARCA To PUL PUL[2]	
State	Fully Defined			
Scope				
Scoping Method	Geometry Selection			
Contact	2 Faces			
Target	2 Faces			
Contact Bodies	SAC_PARCA SAC_PARCA			
Target Bodies	PUL PUL		PUL PUL[2]	
Protected	No			
Definition				
Type	Bonded			
Scope Mode	Automatic			
Behavior	Program Controlled			
Trim Contact	Program Controlled			
Trim Tolerance	2.0223 mm			
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

FIGURE 1
Model (A4) > Connections > Contacts > Bonded - SAC_PARCA|SAC_PARCA To PUL|PUL > Image

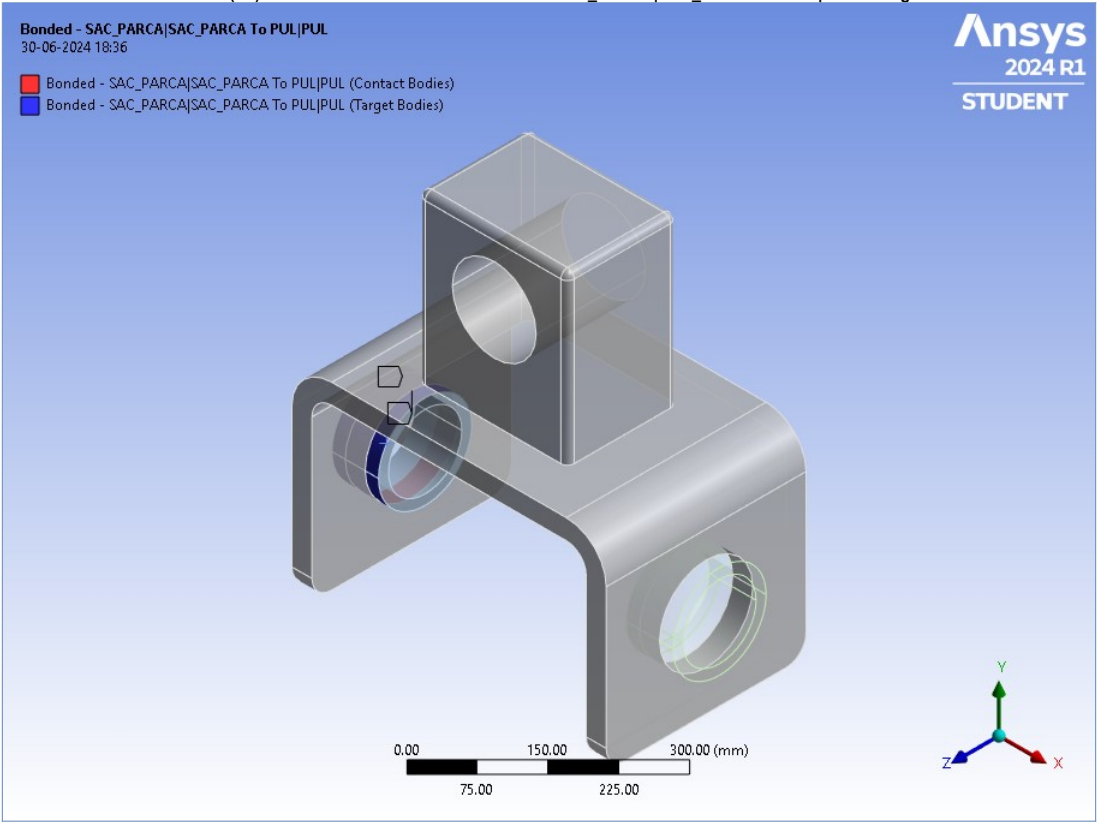
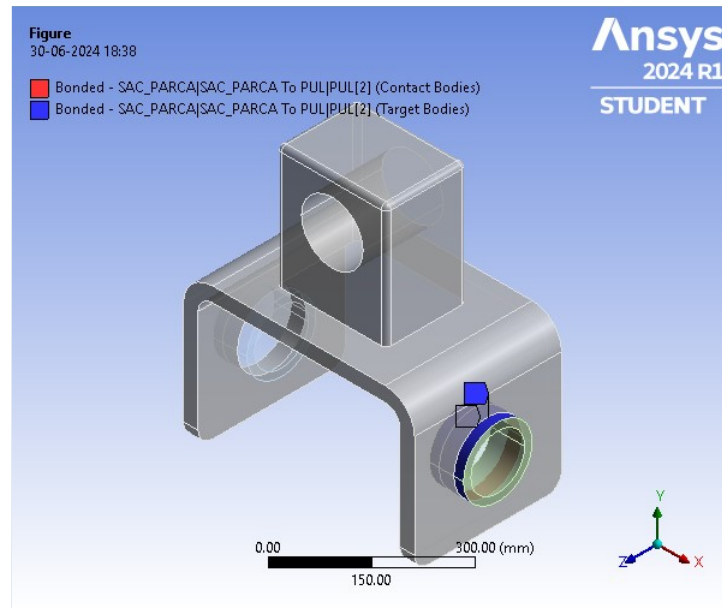


FIGURE 2
Model (A4) > Connections > Contacts > Bonded - SAC_PARCA|SAC_PARCA To PUL|PUL[2] > Figure



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	3
Mesh Defeaturing	Yes
Defeature Size	Default
Transition	Fast
Span Angle Center	Coarse
Initial Size Seed	Assembly
Bounding Box Diagonal	808.94 mm
Average Surface Area	18526 mm ²
Minimum Edge Length	15.708 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	43911
Elements	21765
Show Detailed Statistics	No

TABLE 12
Model (A4) > Mesh > Mesh Controls

Model (A4) > Mesh > Mesh Controls		
Object Name	Sweep Method	Face Sizing
State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Geometry	2 Bodies	36 Faces

Definition		
Suppressed	No	
Method	Sweep	
Algorithm	Program Controlled	
Element Order	Use Global Setting	
Src/Trg Selection	Automatic	
Source Scoping Method	Program Controlled	
Source	Program Controlled	
Free Face Mesh Type	Quad/Tri	
Type	Number of Divisions	Element Size
Sweep Num Divs	20	
Element Option	Solid	
Element Size		15.0 mm
Advanced		
Sweep Bias Type	No Bias	
Defeature Size		Default
Influence Volume		No
Behavior		Soft

Static Structural (A5)

TABLE 13
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 14
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	30. s
Auto Time Stepping	Off
Define By	Substeps
Number Of Substeps	30.
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	
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\Arsh\AppData\Local\Temp\WB_Arsh_21360_2\wbnew_files\dp0\SYSTEMECH
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

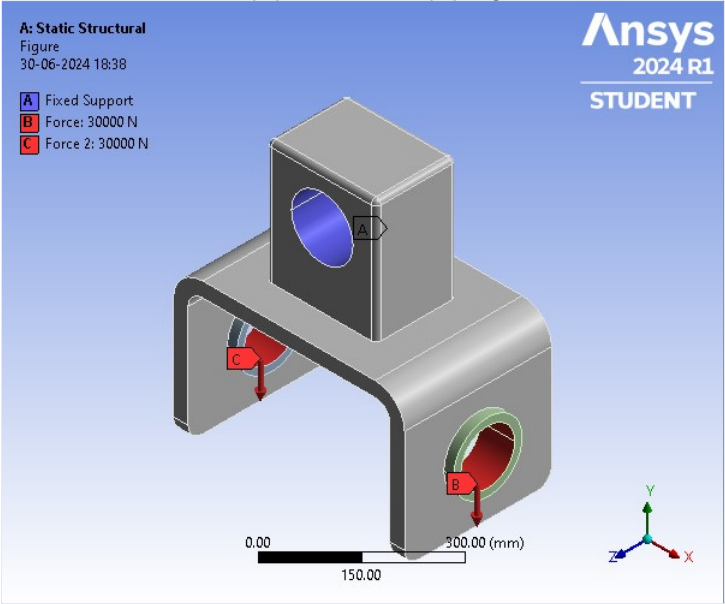


TABLE 15			
Model (A4) > Static Structural (A5) > Loads			
Object Name	Fixed Support	Force	Force 2
State	Fully Defined		
Scope			
Scoping Method	Geometry Selection		
Geometry	2 Faces		
Definition			
Type	Fixed Support	Force	
Suppressed	No		
Define By	Components		
Applied By	Surface Effect		
Coordinate System	Global Coordinate System		
X Component	0. N (ramped)		
Y Component	-30000 N (ramped)		
Z Component	0. N (ramped)		

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

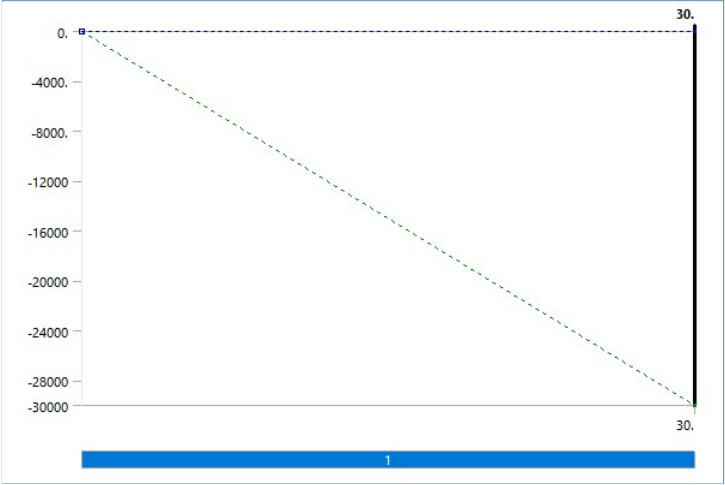


FIGURE 5
Model (A4) > Static Structural (A5) > Force 2



Solution (A6)

TABLE 16
Model (A4) > Static Structural (A5) > Solution

Object Name	<i>Solution (A6)</i>
State	Solved
Adaptive Mesh Refinement	
Max Refinement Loops	1.
Refinement Depth	2.
Information	
Status	Done
MAPDL Elapsed Time	25. s
MAPDL Memory Used	1017. MB
MAPDL Result File Size	275.75 MB
Post Processing	
Beam Section Results	No
On Demand Stress/Strain	No

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

Object Name	<i>Solution Information</i>
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 18
Model (A4) > Static Structural (A5) > Solution (A6) > Results

Object Name	Total Deformation	Directional Deformation	Equivalent Stress
State	Solved		
Scope			
Scoping Method	Geometry Selection		
Geometry	All Bodies		
Definition			
Type	Total Deformation	Directional Deformation	Equivalent (von-Mises) Stress
By	Time		
Display Time	Last		
Separate Data by Entity	No		
Calculate Time History	Yes		
Identifier			
Suppressed	No		
Orientation		Y Axis	
Coordinate System	Global Coordinate System		
Results			
Minimum	0. mm	-0.25097 mm	5.3147e-003 MPa
Maximum	0.59046 mm	1.5411e-002 mm	82.183 MPa
Average	0.17749 mm	-9.3333e-002 mm	7.3117 MPa
Minimum Occurs On	SAC_PARCA SAC_PARCA	PUL PUL[2]	SAC_PARCA SAC_PARCA
Maximum Occurs On	SAC_PARCA SAC_PARCA		
Minimum Value Over Time			
Minimum	0. mm	-0.25097 mm	1.7716e-004 MPa
Maximum	0. mm	-8.3657e-003 mm	5.3147e-003 MPa
Maximum Value Over Time			

Minimum	1.9682e-002 mm	5.137e-004 mm	2.7394 MPa
Maximum	0.59046 mm	1.5411e-002 mm	82.183 MPa
Information			
Time	30. s		
Load Step	1		
Substep	30		
Iteration Number	30		
Integration Point Results			
Display Option			Averaged
Average Across Bodies			No

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

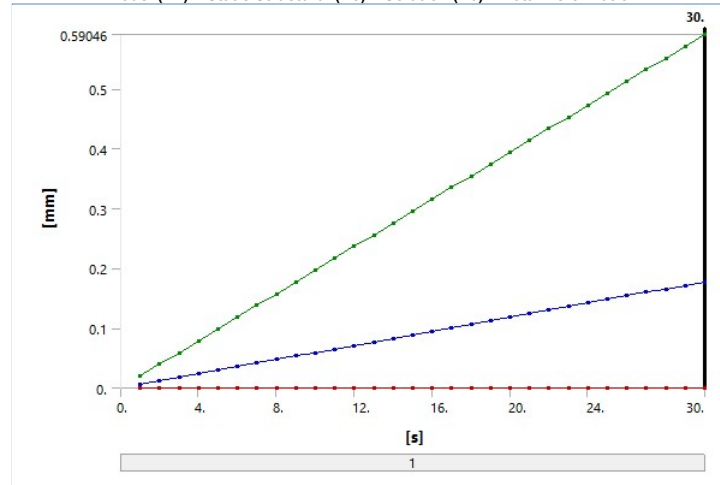


TABLE 19
Model (A4) > Static Structural (A5) > Solution (A6) > Total Deformation

Time [s]	Minimum [mm]	Maximum [mm]	Average [mm]
1.		1.9682e-002	5.9162e-003
2.		3.9364e-002	1.1832e-002
3.		5.9046e-002	1.7749e-002
4.		7.8728e-002	2.3665e-002
5.		9.8411e-002	2.9581e-002
6.		0.11809	3.5497e-002
7.		0.13777	4.1413e-002
8.		0.15746	4.733e-002
9.		0.17714	5.3246e-002
10.		0.19682	5.9162e-002
11.		0.2165	6.5078e-002
12.		0.23619	7.0995e-002
13.		0.25587	7.6911e-002
14.		0.27555	8.2827e-002
15.		0.29523	8.8743e-002
16.	0.	0.31491	9.4659e-002
17.		0.3346	0.10058
18.		0.35428	0.10649
19.		0.37396	0.11241
20.		0.39364	0.11832
21.		0.41332	0.12424
22.		0.43301	0.13016
23.		0.45269	0.13607
24.		0.47237	0.14199
25.		0.49205	0.14791
26.		0.51173	0.15382
27.		0.53142	0.15974
28.		0.5511	0.16565
29.		0.57078	0.17157
30.		0.59046	0.17749

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

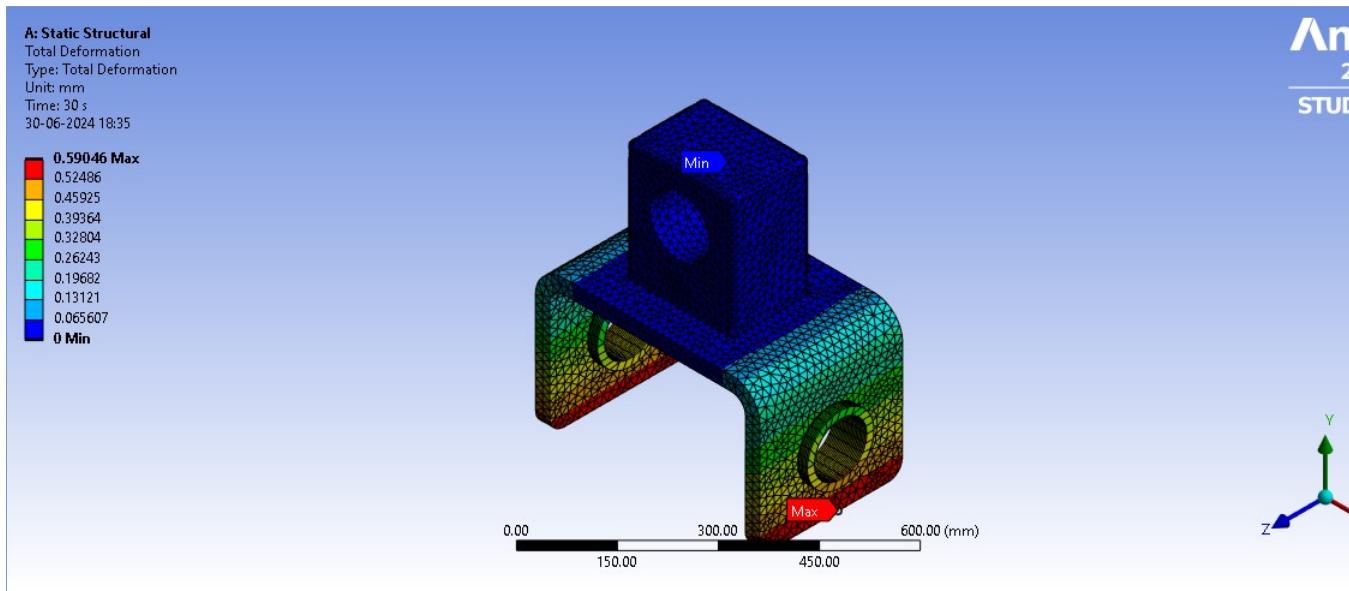


FIGURE 8
Model (A4) > Static Structural (A5) > Solution (A6) > Directional Deformation

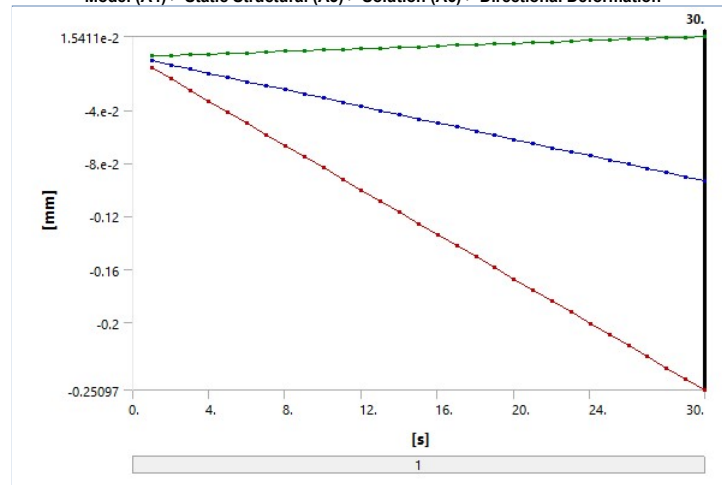


TABLE 20
Model (A4) > Static Structural (A5) > Solution (A6) > Directional Deformation

Time [s]	Minimum [mm]	Maximum [mm]	Average [mm]
1.	-8.3657e-003	5.137e-004	-3.1111e-003
2.	-1.6731e-002	1.0274e-003	-6.2222e-003
3.	-2.5097e-002	1.5411e-003	-9.3333e-003
4.	-3.3463e-002	2.0548e-003	-1.2444e-002
5.	-4.1828e-002	2.5685e-003	-1.5556e-002
6.	-5.0194e-002	3.0822e-003	-1.8667e-002
7.	-5.856e-002	3.5959e-003	-2.1778e-002
8.	-6.6925e-002	4.1096e-003	-2.4889e-002
9.	-7.5291e-002	4.6233e-003	-2.8e-002
10.	-8.3657e-002	5.137e-003	-3.1111e-002
11.	-9.2022e-002	5.6507e-003	-3.4222e-002
12.	-0.10039	6.1644e-003	-3.7333e-002
13.	-0.10875	6.6781e-003	-4.0444e-002
14.	-0.11712	7.1918e-003	-4.3556e-002
15.	-0.12549	7.7055e-003	-4.6667e-002
16.	-0.13385	8.2192e-003	-4.9778e-002
17.	-0.14222	8.7329e-003	-5.2889e-002
18.	-0.15058	9.2466e-003	-5.6e-002
19.	-0.15895	9.7603e-003	-5.9111e-002
20.	-0.16731	1.0274e-002	-6.2222e-002
21.	-0.17568	1.0788e-002	-6.5333e-002
22.	-0.18404	1.1301e-002	-6.8444e-002
23.	-0.19241	1.1815e-002	-7.1556e-002
24.	-0.20078	1.2329e-002	-7.4667e-002
25.	-0.20914	1.2843e-002	-7.7778e-002
26.	-0.21751	1.3356e-002	-8.0889e-002
27.	-0.22587	1.387e-002	-8.4e-002
28.	-0.23424	1.4384e-002	-8.7111e-002
29.	-0.2426	1.4897e-002	-9.0222e-002

30.	-0.25097	1.5411e-002	-9.3333e-002
-----	----------	-------------	--------------

FIGURE 9
Model (A4) > Static Structural (A5) > Solution (A6) > Directional Deformation > Image

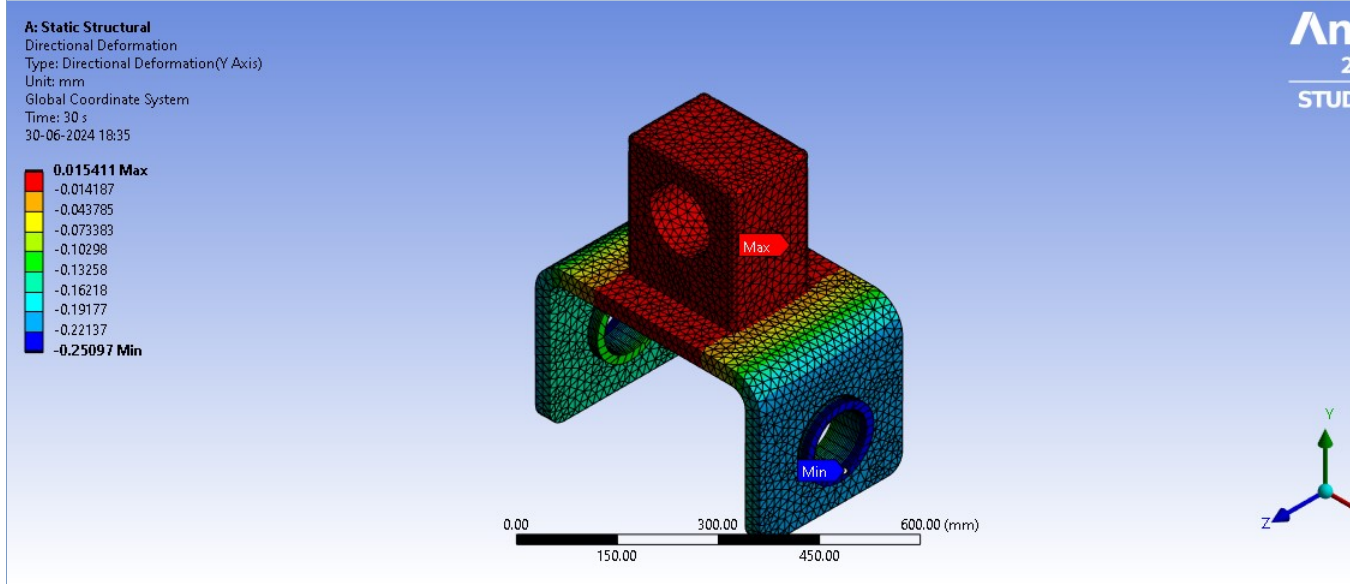


FIGURE 10
Model (A4) > Static Structural (A5) > Solution (A6) > Equivalent Stress

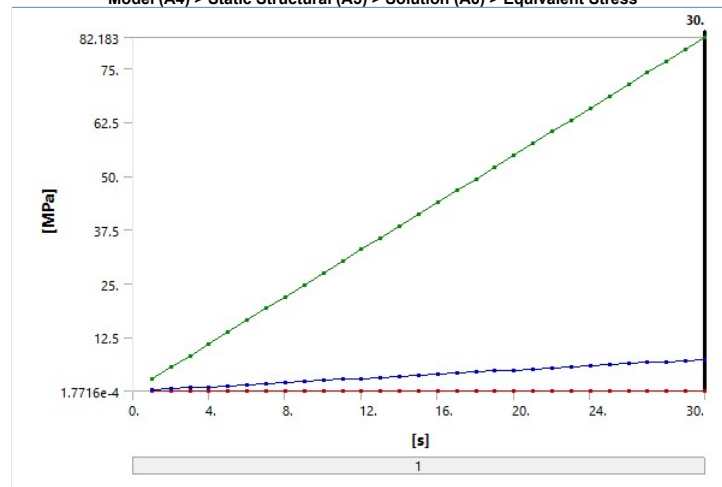


TABLE 21
Model (A4) > Static Structural (A5) > Solution (A6) > Equivalent Stress

Time [s]	Minimum [MPa]	Maximum [MPa]	Average [MPa]
1.	1.7716e-004	2.7394	0.24372
2.	3.5431e-004	5.4789	0.48745
3.	5.3147e-004	8.2183	0.73117
4.	7.0863e-004	10.958	0.97489
5.	8.8579e-004	13.697	1.2186
6.	1.0629e-003	16.437	1.4623
7.	1.2401e-003	19.176	1.7061
8.	1.4173e-003	21.915	1.9498
9.	1.5944e-003	24.655	2.1935
10.	1.7716e-003	27.394	2.4372
11.	1.9487e-003	30.134	2.681
12.	2.1259e-003	32.873	2.9247
13.	2.303e-003	35.613	3.1684
14.	2.4802e-003	38.352	3.4121
15.	2.6574e-003	41.092	3.6559
16.	2.8345e-003	43.831	3.8996
17.	3.0117e-003	46.57	4.1433
18.	3.1888e-003	49.31	4.387
19.	3.366e-003	52.049	4.6307
20.	3.5431e-003	54.789	4.8745
21.	3.7203e-003	57.528	5.1182
22.	3.8975e-003	60.268	5.3619
23.	4.0746e-003	63.007	5.6056
24.	4.2518e-003	65.746	5.8494
25.	4.4289e-003	68.486	6.0931

26.	4.6061e-003	71.225	6.3368
27.	4.7832e-003	73.965	6.5805
28.	4.9604e-003	76.704	6.8243
29.	5.1376e-003	79.444	7.068
30.	5.3147e-003	82.183	7.3117

FIGURE 11
Model (A4) > Static Structural (A5) > Solution (A6) > Equivalent Stress > Image

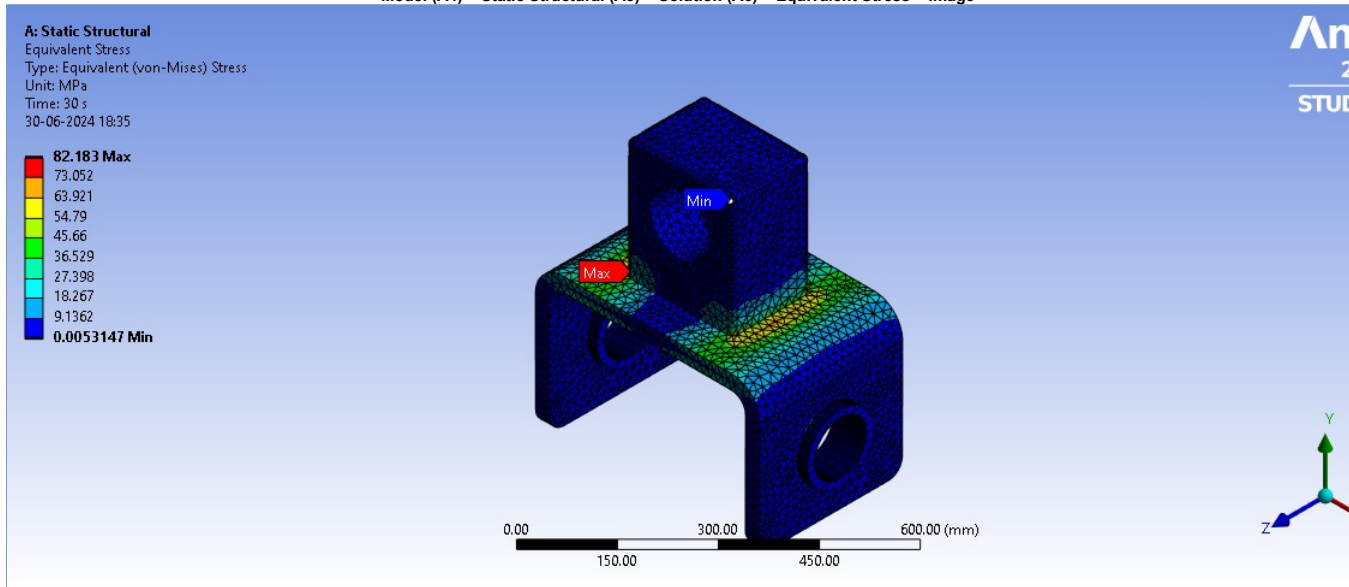


TABLE 22
Model (A4) > Static Structural (A5) > Solution (A6) > Fatigue Tools

Object Name	<i>Fatigue Tool</i>
State	Solved
Domain	
Domain Type	Time
Materials	
Fatigue Strength Factor (Kf)	1.
Loading	
Type	Fully Reversed
Scale Factor	1.
Definition	
Display Time	End Time
Options	
Analysis Type	Stress Life
Mean Stress Theory	None
Stress Component	Equivalent (von-Mises)
Life Units	
Units Name	cycles
1 cycle is equal to	1. cycles

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

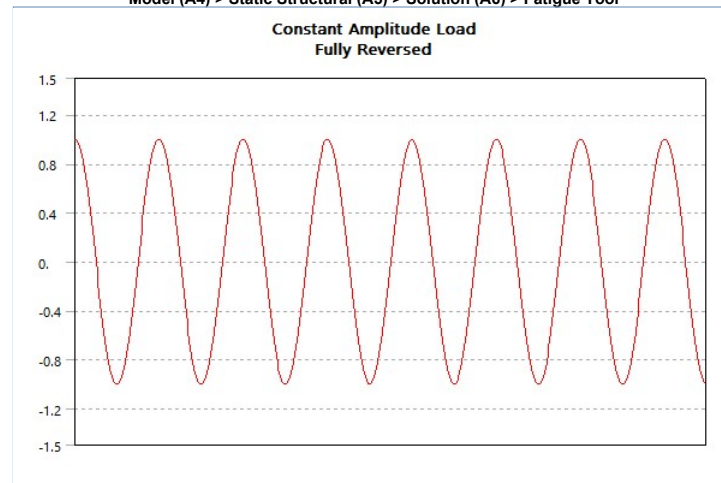


FIGURE 13
Model (A4) > Static Structural (A5) > Solution (A6) > Fatigue Tool

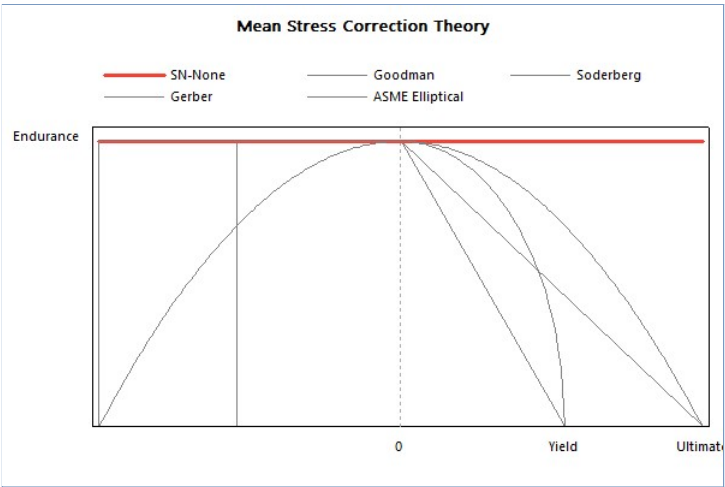
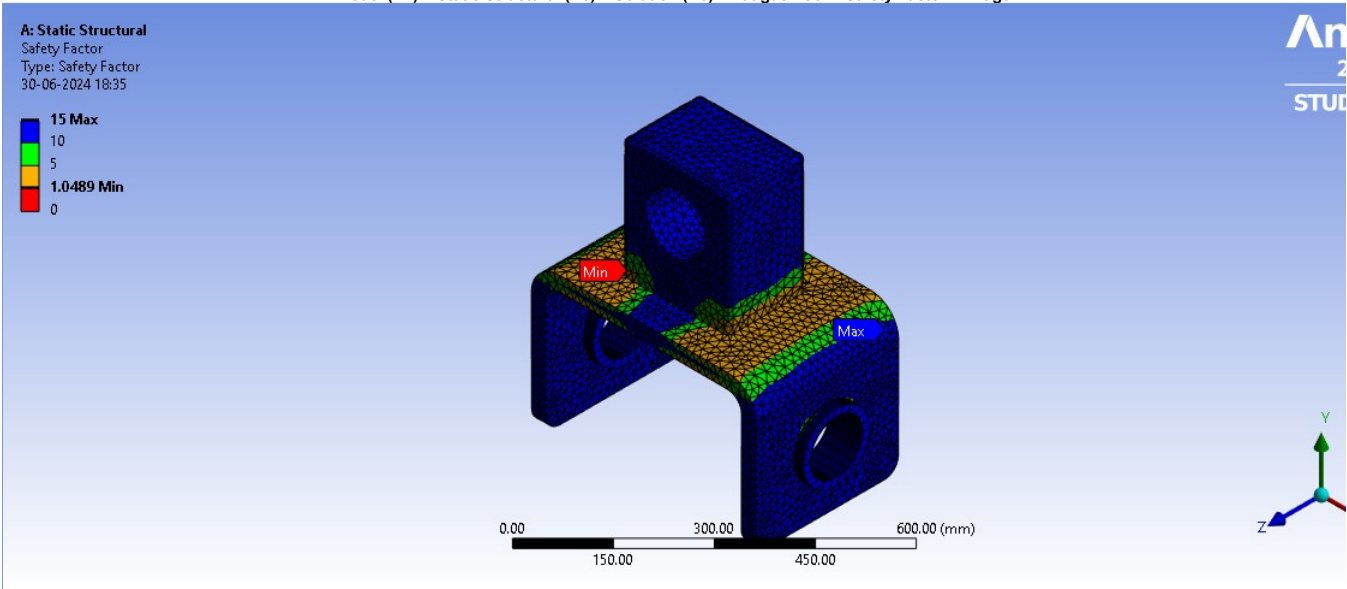


TABLE 23
Model (A4) > Static Structural (A5) > Solution (A6) > Fatigue Tool > Results

Object Name	Safety Factor
State	Solved
Scope	
Scoping Method	Geometry Selection
Geometry	All Bodies
Definition	
Design Life	1.e+009 cycles
Type	Safety Factor
Identifier	
Suppressed	No
Results	
Minimum	1.0489
Minimum Occurs On	SAC_PARCA SAC_PARCA

FIGURE 14
Model (A4) > Static Structural (A5) > Solution (A6) > Fatigue Tool > Safety Factor > Image



Material Data

Structural Steel

TABLE 24
Structural Steel > Constants

Density	7.85e-006 kg mm ⁻³
Coefficient of Thermal Expansion	1.2e-005 C ⁻¹
Specific Heat	4.34e+005 mJ kg ⁻¹ C ⁻¹
Thermal Conductivity	6.05e-002 W mm ⁻¹ C ⁻¹
Resistivity	1.7e-004 ohm mm

TABLE 25
Structural Steel > Color

Red	Green	Blue
132	139	179

TABLE 26
Structural Steel > Compressive Ultimate Strength

Compressive Ultimate Strength MPa
0

TABLE 27
Structural Steel > Compressive Yield Strength

Compressive Yield Strength MPa
250

TABLE 28
Structural Steel > Tensile Yield Strength

Tensile Yield Strength MPa
250

TABLE 29
Structural Steel > Tensile Ultimate Strength

Tensile Ultimate Strength MPa
460

TABLE 30
Structural Steel > Isotropic Secant Coefficient of Thermal Expansion

Zero-Thermal-Strain Reference Temperature C
22

TABLE 31
Structural Steel > S-N Curve

Alternating Stress MPa	Cycles	Mean Stress MPa
3999	10	0
2827	20	0
1896	50	0
1413	100	0
1069	200	0
441	2000	0
262	10000	0
214	20000	0
138	1.e+005	0
114	2.e+005	0
86.2	1.e+006	0

TABLE 32
Structural Steel > Strain-Life Parameters

Strength Coefficient MPa	Strength Exponent	Ductility Coefficient	Ductility Exponent	Cyclic Strength Coefficient MPa	Cyclic Strain Hardening Exponent
920	-0.106	0.213	-0.47	1000	0.2

TABLE 33
Structural Steel > Isotropic Elasticity

Young's Modulus MPa	Poisson's Ratio	Bulk Modulus MPa	Shear Modulus MPa	Temperature C
2.e+005	0.3	1.6667e+005	76923	

TABLE 34
Structural Steel > Isotropic Relative Permeability

Relative Permeability
10000