Study Report

Analyzed File	Lower Column v3 v10
Version	Autodesk Fusion (2.0.20754)
Creation Date	2024-11-25, 14:00:05
Author	dulnethweerasinghe

Report Properties

Title	Studies
Author	dulnethweerasinghe

Simulation Model 1

Study 1 - Static Stress

Study Properties

Study Type	Static Stress
Last Modification Date	2024-11-25, 12:40:50

Settings

General

Contact Tolerance	0.10 mm
Remove Rigid Body Modes	No

Mesh

Average Element Size (% of model size)	
Solids	3
Scale Mesh Size Per Part	Yes
Average Element Size (absolute value)	-
Element Order	Parabolic
Create Curved Mesh Elements	Yes
Max. Turn Angle on Curves (Deg.)	20
Max. Adjacent Mesh Size Ratio	1.5
Max. Aspect Ratio	9
Minimum Element Size (% of average size)	20

Adaptive Mesh Refinement

Number of Refinement Steps	4
Results Convergence Tolerance (%)	10
Portion of Elements to Refine (%)	25
Results for Baseline Accuracy	von Mises Stress

Materials

Component	Material	Safety Factor
Body1	Steel, Mild	Yield Strength
Lower Column v3:1	Steel, Mild	Yield Strength

Steel, Mild

Density	7.850E-06 kg / mm^3
Young's Modulus	220000.00 MPa
Poisson's Ratio	0.275
Yield Strength	207.00 MPa
Ultimate Tensile Strength	345.00 MPa
Thermal Conductivity	0.045 W / (mm C)
Thermal Expansion Coefficient	1.200E-05 / C

Specific Heat	480.00 J / (kg C)

Contacts

Bonded

Name
[S] Bonded1 [Simulation Model 1:1||Lower Column v3:1]

Mesh

Type	Nodes	Elements
Solids	214924	128692

Load Case1

Constraints

Pin1

Type	Pin
Radial	Fixed
Axial	Fixed
Tangential	Free

Selected Entities

Pin2

Type	Pin
Radial	Fixed
Axial	Fixed
Tangential	Free

Selected Entities

Loads

Gravity

Type	Gravity
Magnitude	9.807 m / s^2
X Value	-3.079 m / s^2
Y Value	0.00 m / s^2
Z Value	-9.311 m / s^2
X Angle	-18.3 deg
Y Angle	0.0 deg
Z Angle	0.0 deg

Selected Entities

Force1

Type	Force
Magnitude	440.00 N
X Value	0.00 N
Y Value	-440.00 N
Z Value	0.00 N
X Angle	0.0 deg

Y Angle	0.0 deg
Z Angle	0.0 deg
Radius	30.00 mm
Force Per Entity	No

Selected Entities

Results

Result Summary

Name	Minimum	Maximum
Safety Factor		
Safety Factor (Per Body)	2.904	15.00
Stress		
von Mises	0.008 MPa	71.27 MPa
1st Principal	-28.028 MPa	79.752 MPa
3rd Principal	-79.357 MPa	24.864 MPa
Normal XX	-50.902 MPa	48.421 MPa
Normal YY	-33.195 MPa	30.727 MPa
Normal ZZ	-71.937 MPa	73.634 MPa
Shear XY	-12.853 MPa	14.346 MPa
Shear YZ	-29.48 MPa	16.881 MPa
Shear ZX	-14.617 MPa	14.496 MPa
Displacement		
Total	3.417E-07 mm	0.012 mm
X	-2.688E-04 mm	2.649E-04 mm
Y	-0.012 mm	2.466E-05 mm
Z	-0.002 mm	0.002 mm
Reaction Force		
Total	0.00 N	15.444 N
X	-1.883 N	1.799 N
Y	-0.751 N	4.043 N
Z	-13.847 N	15.339 N
Strain		
Equivalent	0.00	4.603E-04

1st Principal	0.00	4.659E-04
3rd Principal	-4.542E-04	0.00
Normal XX	-1.107E-04	1.077E-04
Normal YY	-1.410E-04	1.330E-04
Normal ZZ	-2.829E-04	2.788E-04
Shear XY	-1.490E-04	1.663E-04
Shear YZ	-3.417E-04	1.957E-04
Shear ZX	-1.694E-04	1.680E-04
Contact Pressure		
Total	0.00 MPa	6.668 MPa
X	-0.848 MPa	1.134 MPa
Y	-3.961 MPa	6.625 MPa
Z	-2.202 MPa	2.714 MPa
Contact Force		
Total	0.00 N	18.531 N
X	-2.165 N	4.546 N
Y	-18.523 N	16.439 N
Z	-7.963 N	9.044 N

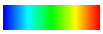
⊟ Safety Factor

⊟ Safety Factor (Per Body)

0.00  8.00

⊟ Stress

⊟ von Mises

[MPa] 0.008  71.27

1st Principal

[MPa] -28.028 79.752

3rd Principal

[MPa] -79.357 24.864

Displacement

Total


[mm] 0.00
0.012