Study Report

Analyzed File	Motor_Shaft v5 v75
Version	Autodesk Fusion (2.0.20754)
Creation Date	2024-11-25, 14:00:51
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, 14:00:24

Settings

General

Contact Tolerance	0.10 mm
Remove Rigid Body Modes	No

Mesh

Average Element Size (% of model size)	
Solids	4
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	1.4
Max. Aspect Ratio	8
Minimum Element Size (% of average size)	15

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

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

Mesh

Type	Nodes	Elements
Solids	1160051	791200

Load Case1

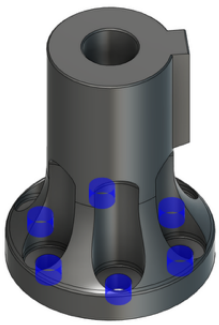
⚠ **Solve result of this load case is out of date.**

Constraints

Fixed1

Type	Fixed
Ux	Fixed
Uy	Fixed
Uz	Fixed

Selected Entities



Loads

Gravity

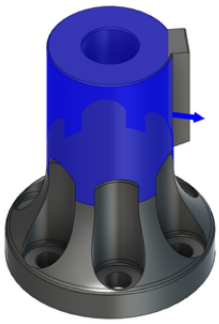
Type	Gravity
Magnitude	9.807 m / s^2
X Value	0.00 m / s^2
Y Value	0.00 m / s^2
Z Value	-9.807 m / s^2

Selected Entities

Force1

Type	Force
Magnitude	440.00 N
X Value	132.00 N
Y Value	419.733 N
Z Value	0.00 N
X Angle	0.0 deg
Y Angle	0.0 deg
Z Angle	0.0 deg
Flip Direction	Yes
Force Per Entity	No

Selected Entities



Results

Result Summary

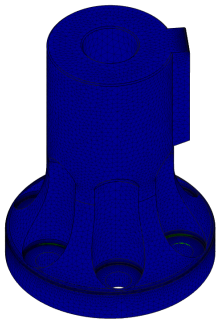
Name	Minimum	Maximum
Safety Factor		
Safety Factor (Per Body)	3.982	15.00
Stress		

von Mises	3.980E-04 MPa	51.981 MPa
1st Principal	-15.483 MPa	64.821 MPa
3rd Principal	-64.678 MPa	15.25 MPa
Normal XX	-54.164 MPa	55.367 MPa
Normal YY	-46.975 MPa	42.322 MPa
Normal ZZ	-45.373 MPa	45.751 MPa
Shear XY	-18.218 MPa	18.172 MPa
Shear YZ	-13.721 MPa	26.209 MPa
Shear ZX	-20.59 MPa	25.443 MPa
Displacement		
Total	0.00 mm	0.006 mm
X	-1.163E-04 mm	0.002 mm
Y	-1.216E-04 mm	0.005 mm
Z	-0.002 mm	0.002 mm
Reaction Force		
Total	0.00 N	2.258 N
X	-1.712 N	1.71 N
Y	-1.677 N	1.353 N
Z	-1.242 N	1.229 N
Strain		
Equivalent	2.447E-09	3.973E-04
1st Principal	-3.044E-07	4.283E-04
3rd Principal	-4.242E-04	1.362E-07
Normal XX	-1.959E-04	2.004E-04
Normal YY	-1.519E-04	1.498E-04
Normal ZZ	-1.854E-04	1.877E-04
Shear XY	-2.112E-04	2.106E-04
Shear YZ	-1.590E-04	3.038E-04
Shear ZX	-2.387E-04	2.949E-04
Contact Force		
Total	0.00 N	0.00 N
X	0.00 N	0.00 N
Y	0.00 N	0.00 N
Z	0.00 N	0.00 N

⊟ Safety Factor

⊟ Safety Factor (Per Body)

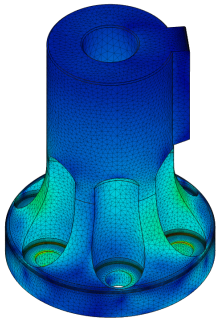
0.00  8.00



Stress

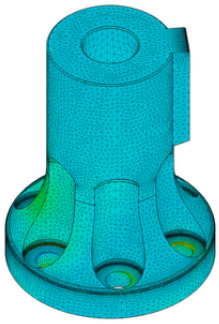
von Mises

[MPa] 0.00 51.981



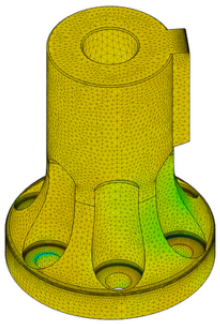
1st Principal

[MPa] -15.483 64.821



3rd Principal

[MPa] -64.678 15.25



Displacement

Total

[mm] 0.00 0.006