V5 250N STATIC LOAD

Study Report

Analyzed File	V5 v5
Version	Autodesk Fusion 360 (2.0.3803)
Creation Date	2018-03-18, 20:34:34
Author	

⊟ Simulation Model 1:1

⊟ Study 1 -(250N) Static Stress

⊟ Study Properties

Study Type	Static Stress
Last Modification Date	2018-03-18, 20:27:09

⊟ Settings

⊟ General

Contact Tolerance	0.1 mm
Remove Rigid Body Modes	No

⊟ Mesh

Average Element Size (% of model size)	
Solids	10
Scale Mesh Size Per Part	No
Average Element Size (absolute value)	-
Element Order	Parabolic
Create Curved Mesh Elements	Yes
Max. Turn Angle on Curves (Deg.)	60
Max. Adjacent Mesh Size Ratio	1.5
Max. Aspect Ratio	10
Minimum Element Size (% of average size)	20

⊟ Adaptive Mesh Refinement

Number of Refinement Steps	0
Results Convergence Tolerance (%)	20
Portion of Elements to Refine (%)	10
Results for Baseline Accuracy	Von Mises Stress

⊟ Materials

Component	Material	Safety Factor
Headset V5 v1:1	PLA (3D Printed)	Yield Strength
Top Cover V5 v1:1	PLA (3D Printed)	Yield Strength

⊟ PLA (3D Printed)

Density	3.75E-07 kg / mm^3
Young's Modulus	3400 MPa
Poisson's Ratio	0.38
Yield Strength	13 MPa
Ultimate Tensile Strength	15 MPa
Thermal Conductivity	1.6E-04 W / (mm C)
Thermal Expansion Coefficient	8.57E-05 / C
Specific Heat	1500 J / (kg C)

⊟ Contacts

⊟ Bonded

Name
[S] Bonded1 [Headset V5 v1:1||Top Cover V5 v1:1]
[S] Bonded2 [Headset V5 v1:1||Top Cover V5 v1:1]

⊟ Mesh

Type	Nodes	Elements
Solids	43425	23187

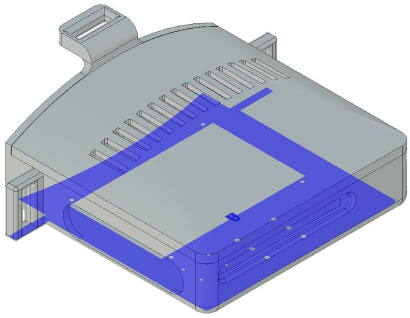
⊟ Load Case1

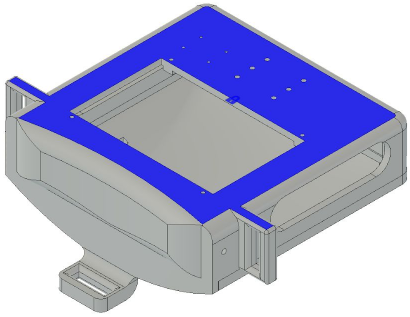
⊟ Constraints

⊟ Fixed1

Type	Fixed
Ux	Yes
Uy	Yes
Uz	Yes

⊟ Selected Entities



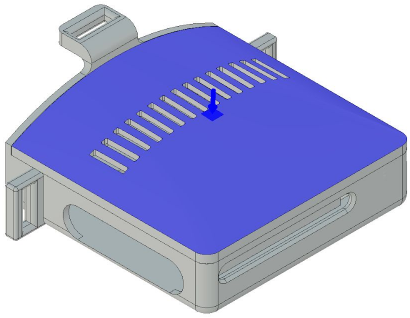


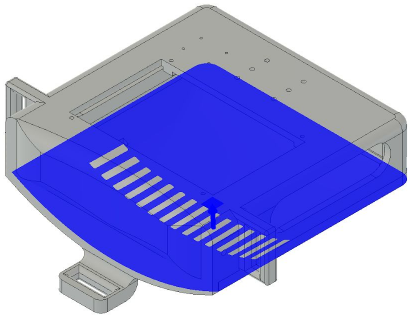
⊟ Loads

⊟ Pressure1

Type	Pressure
Magnitude	0.008304 MPa

⊟ Selected Entities





Results

Result Summary

Name	Minimum	Maximum
Safety Factor		
Per Body	3.551	15
Stress		
Von Mises	7.998E-07 MPa	3.661 MPa
1st Principal	-0.9877 MPa	5.662 MPa
3rd Principal	-4.158 MPa	1.81 MPa
Normal XX	-3.145 MPa	4.414 MPa
Normal YY	-3.941 MPa	4.095 MPa
Normal ZZ	-2.2 MPa	2.439 MPa
Shear XY	-1.878 MPa	1.748 MPa
Shear YZ	-0.6424 MPa	0.8271 MPa

Shear ZX	-1.264 MPa	1.222 MPa
Displacement		
Total	0 mm	0.2114 mm
X	-0.04344 mm	0.04941 mm
Y	-0.2098 mm	0.009054 mm
Z	-0.04114 mm	0.0295 mm
Reaction Force		
Total	0 N	15.85 N
X	-6.009 N	6.938 N
Y	-5.835 N	15.21 N
Z	-4.091 N	2.114 N
Strain		
Equivalent	3.275E-10	0.001942
1st Principal	2.152E-10	0.001863
3rd Principal	-0.001511	-2.12E-10
Normal XX	-7.849E-04	6.984E-04
Normal YY	-8.563E-04	7.048E-04
Normal ZZ	-5.23E-04	3.86E-04
Shear XY	-0.001524	0.001419
Shear YZ	-5.215E-04	6.714E-04
Shear ZX	-0.001026	9.92E-04
Contact Pressure		
Total	0 MPa	4.295 MPa
X	-1.29 MPa	1.314 MPa
Y	-4.095 MPa	3.941 MPa
Z	-0.3589 MPa	0.3432 MPa

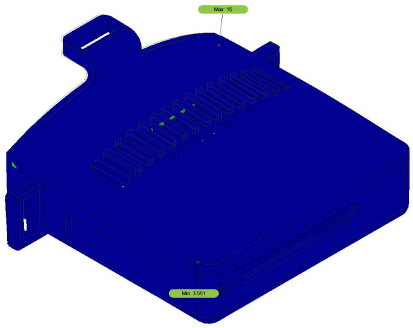
⊟ Reaction Forces

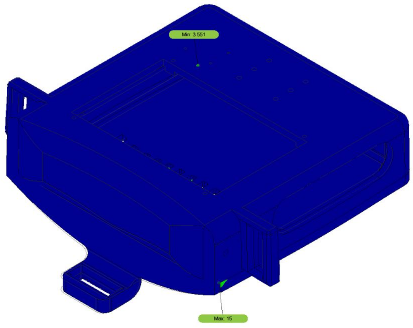
Constraint Name	**Reaction Force**		**Reaction Moment**	
	Magnitude	**Component (X,Y,Z)**	**Magnitude**	**Component (X,Y,Z)**
Fixed1	236 N	0.1898 N	2577 N mm	-2573 N mm
		234.9 N		46.1 N mm
		-22.75 N		134.5 N mm

⊟ Safety Factor

⊟ Per Body

0 8

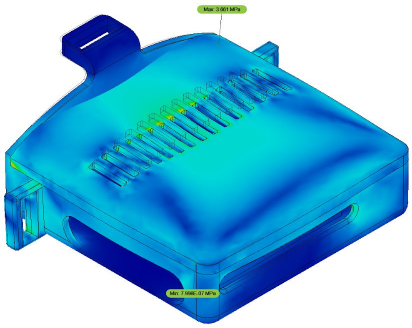


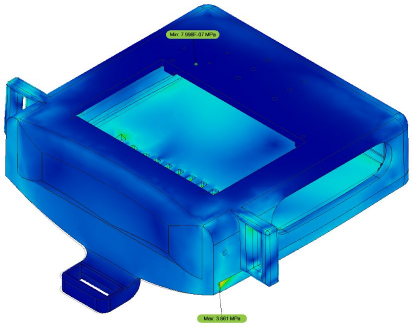


⊟ Stress

⊟ Von Mises

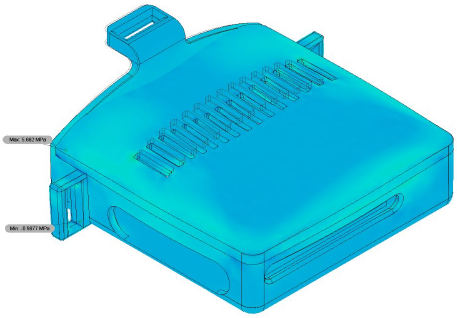
[MPa] 0 3.661

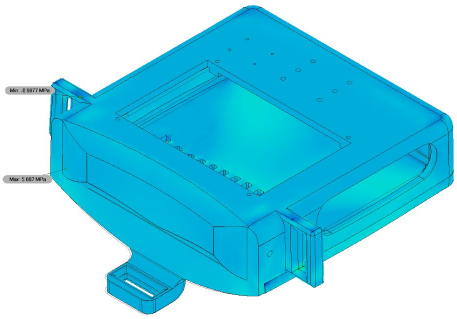




⊟ **1st Principal**

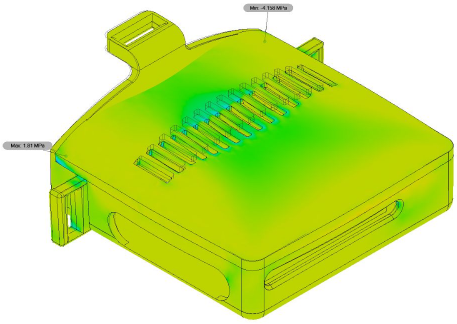
[MPa] -0.988 5.662

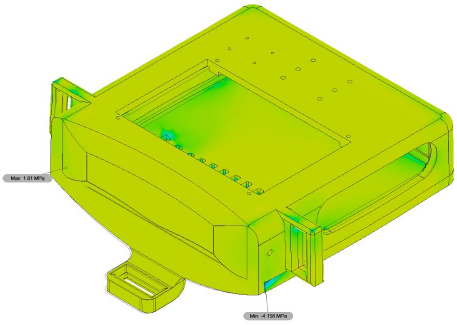




⊟ 3rd Principal

[MPa] -4.158 1.81

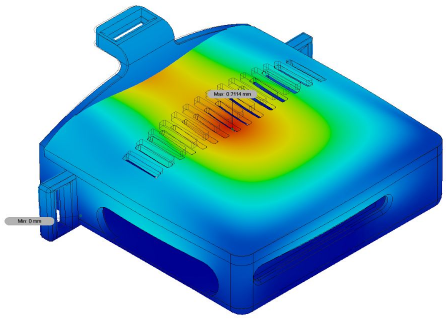


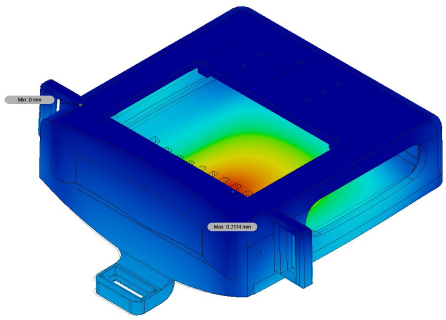


⊟ Displacement

⊟ Total

[mm] 0 0.2114

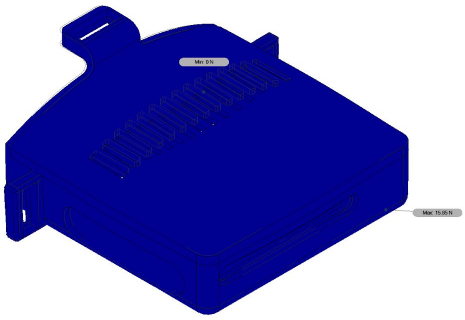


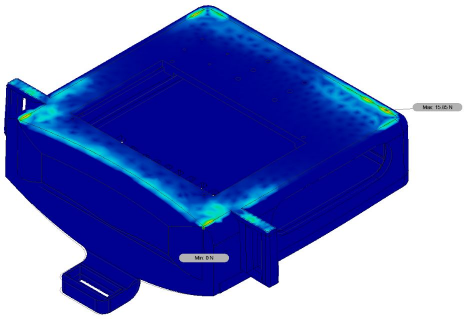


⊟ Reaction Force

⊟ Total

[N] 0 15.85

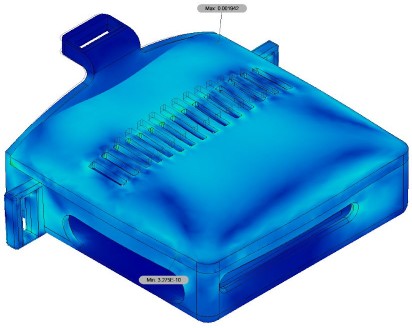


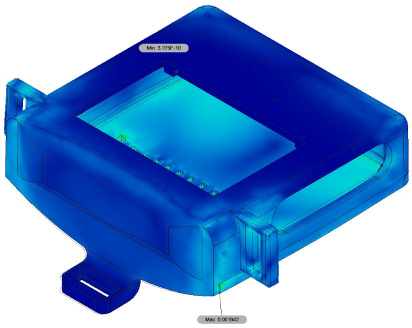


⊟ Strain

⊟ Equivalent

0 0.001942





⊟ Contact Pressure

⊟ **Total**

[MPa] 0  4.295