

V1 250N STATIC LOAD

Study Report

Analyzed File	V1 v8
Version	Autodesk Fusion 360 (2.0.3803)
Creation Date	2018-03-18, 21:33:21
Author	

▣ Simulation Model 1:1

▣ Study 1 - (250N) Static Stress

▣ Study Properties

Study Type	Static Stress
Last Modification Date	2018-03-18, 21:25:22

▣ 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 v1:1	PLA (3D Printed)	Yield Strength
Top Cover v1:1	PLA (3D Printed)	Yield Strength
Back Cover 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 [Back Cover v1:1 Top Cover v1:1]
[S] Bonded2 [Back Cover v1:1 Top Cover v1:1]
[S] Bonded3 [Headset v1:1 Back Cover v1:1]
[S] Bonded4 [Headset v1:1 Back Cover v1:1]
[S] Bonded5 [Headset v1:1 Top Cover v1:1]
[S] Bonded6 [Headset v1:1 Top Cover v1:1]
[S] Bonded7 [Headset v1:1 Top Cover v1:1]
[S] Bonded8 [Headset v1:1 Top Cover v1:1]
[S] Bonded9 [Headset v1:1 Back Cover v1:1]

[S] Bonded10 [Headset v1:1 Top Cover v1:1]
[S] Bonded11 [Headset v1:1 Back Cover v1:1]

▣ **Mesh**

Type	Nodes	Elements
Solids	26277	13263

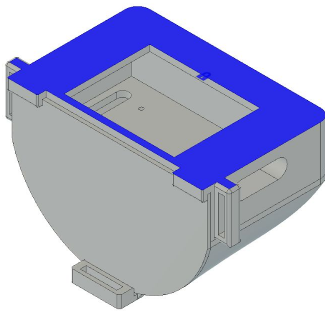
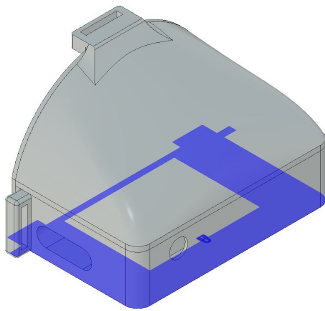
▣ **Load Case1**

▣ **Constraints**

▣ **Fixed1**

Type	Fixed
Ux	Yes
Uy	Yes
Uz	Yes

▣ **Selected Entities**

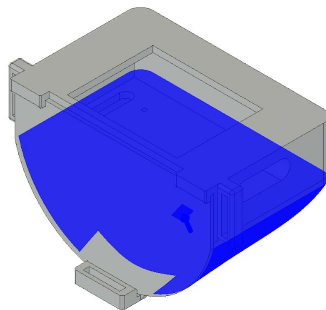
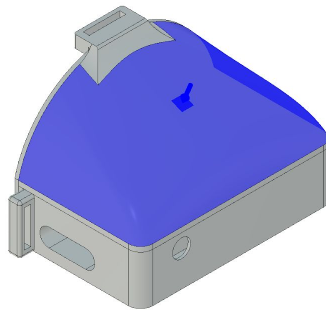


▣ Loads

▣ Pressure1

Type	Pressure
Magnitude	0.01191 MPa

▣ Selected Entities



▣ Results

▣ Result Summary

Name	Minimum	Maximum
Safety Factor		
Per Body	10.65	15
Stress		
Von Mises	1.202E-04 MPa	1.22 MPa

1st Principal	-0.5499 MPa	0.8538 MPa
3rd Principal	-1.388 MPa	0.3507 MPa
Normal XX	-0.9055 MPa	0.5953 MPa
Normal YY	-1.199 MPa	0.5714 MPa
Normal ZZ	-0.6969 MPa	0.6597 MPa
Shear XY	-0.4515 MPa	0.4859 MPa
Shear YZ	-0.2879 MPa	0.3014 MPa
Shear ZX	-0.4554 MPa	0.509 MPa
Displacement		
Total	0 mm	0.06385 mm
X	-0.01041 mm	0.01054 mm
Y	-0.05461 mm	0.007246 mm
Z	-0.01172 mm	0.03331 mm
Reaction Force		
Total	0 N	3.293 N
X	-1.145 N	1.231 N
Y	-1.372 N	2.933 N
Z	-1.497 N	1.012 N
Strain		
Equivalent	5.843E-08	6.275E-04
1st Principal	4.974E-08	4.687E-04
3rd Principal	-6.609E-04	9.008E-07
Normal XX	-1.894E-04	1.081E-04
Normal YY	-2.304E-04	1.407E-04
Normal ZZ	-1.235E-04	1.188E-04
Shear XY	-3.665E-04	3.944E-04
Shear YZ	-2.337E-04	2.446E-04
Shear ZX	-3.696E-04	4.132E-04
Contact Pressure		
Total	0 MPa	1.154 MPa
X	-0.3419 MPa	0.4913 MPa
Y	-1.147 MPa	0.6117 MPa
Z	-0.6162 MPa	0.3273 MPa

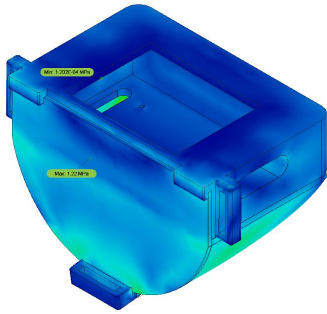
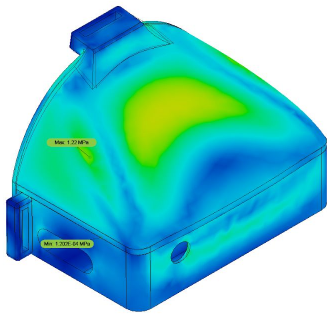
☐ **Reaction Forces**

Constraint Name	Reaction Force		Reaction Moment	
	Magnitude	Component (X,Y,Z)	Magnitude	Component (X,Y,Z)
Fixed1	197.8 N	-1.138E-05 N	6060 N mm	-6060 N mm
		178.5 N		-0.2124 N mm
		-85.15 N		1.648 N mm

☐ **Stress**

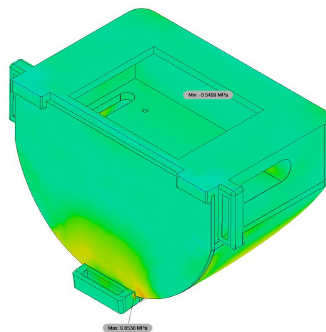
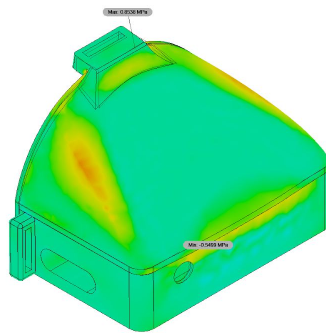
☐ **Von Mises**

[MPa] 0  1.22



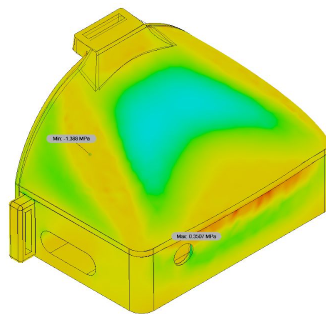
☐ **1st Principal**

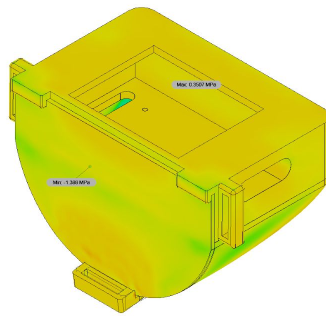
[MPa] -0.5499  0.8538



☐ **3rd Principal**

[MPa] -1.388 0.351

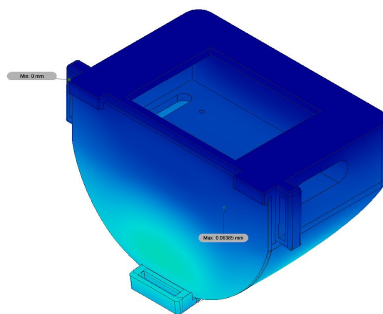
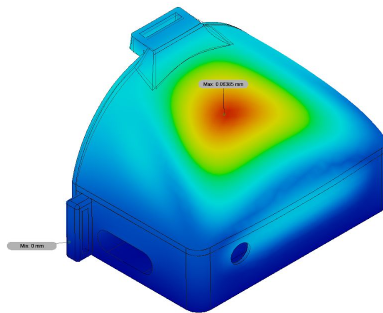




▣ **Displacement**

▣ **Total**

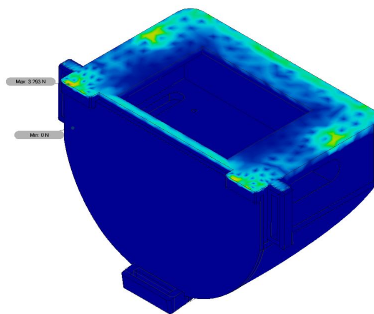
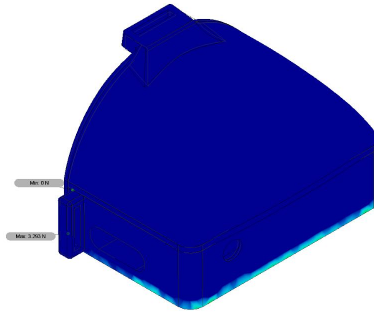
[mm] 0  0.06385



▣ **Reaction Force**

☐ **Total**

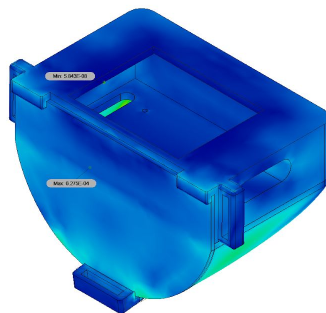
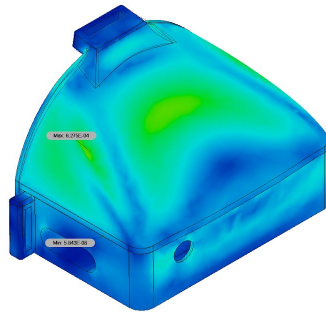
[N] 0  3.293



☐ **Strain**

☐ **Equivalent**

0.001E-04  6.275E-04



☐ Contact Pressure

☐ Total

[MPa] 0  1.154

