

# V4 250N STATIC LOAD

---

## Study Report

Analyzed File	V4 v7
Version	Autodesk Fusion 360 (2.0.3803)
Creation Date	2018-03-18, 21:02:53
Author	

---

### ▣ Simulation Model 1:1

#### ▣ Study 1 - (250N) Static Stress

##### ▣ Study Properties

Study Type	Static Stress
Last Modification Date	2018-03-18, 20:55:47

##### ▣ 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 V4 v1:1	PLA (3D Printed)	Yield Strength
Top Cover V4 v1:1	PLA (3D Printed)	Yield Strength
Back Cover V4 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 V4 v1:1  Top Cover V4 v1:1]
[S] Bonded2 [Headset V4 v1:1  Top Cover V4 v1:1]
[S] Bonded3 [Headset V4 v1:1  Top Cover V4 v1:1]
[S] Bonded4 [Headset V4 v1:1  Top Cover V4 v1:1]
[S] Bonded5 [Headset V4 v1:1  Top Cover V4 v1:1]
[S] Bonded6 [Headset V4 v1:1  Back Cover V4 v1:1]

▣ **Mesh**

Type	Nodes	Elements
------	-------	----------

Solids	50393	26859
--------	-------	-------

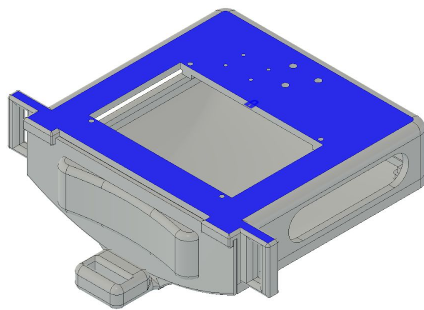
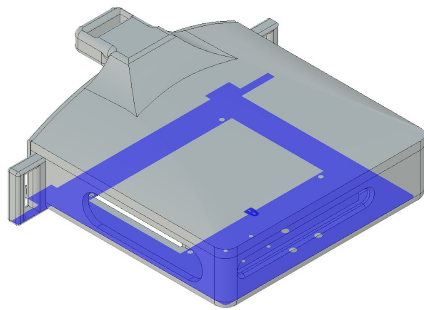
[-] **Load Case1**

[-] **Constraints**

[-] **Fixed1**

Type	Fixed
Ux	Yes
Uy	Yes
Uz	Yes

[-] **Selected Entities**



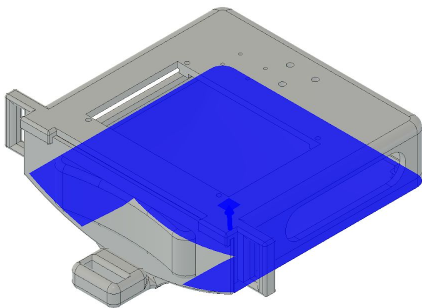
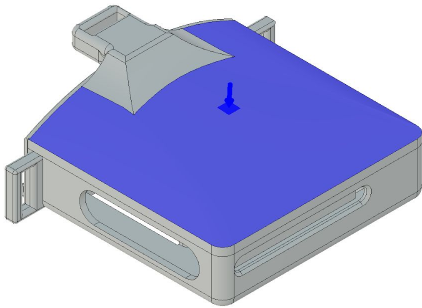
[-] **Loads**

[-] **Pressure1**

Type	Pressure
------	----------

Magnitude	0.008929 MPa
-----------	--------------

☐
**Selected Entities**



☐
**Results**

☐
**Result Summary**

Name	Minimum	Maximum
Safety Factor		
Per Body	2.407	15
Stress		
Von Mises	1.008E-07 MPa	5.401 MPa
1st Principal	-1.931 MPa	2.777 MPa
3rd Principal	-4.144 MPa	0.8365 MPa
Normal XX	-3.138 MPa	1.915 MPa
Normal YY	-3.25 MPa	1.547 MPa

Normal ZZ	-2.108 MPa	1.752 MPa
Shear XY	-3.011 MPa	1.363 MPa
Shear YZ	-0.9918 MPa	1.086 MPa
Shear ZX	-0.9826 MPa	0.8283 MPa
Displacement		
Total	0 mm	0.1548 mm
X	-0.04283 mm	0.04757 mm
Y	-0.1543 mm	0.007011 mm
Z	-0.05888 mm	0.01515 mm
Reaction Force		
Total	0 N	24.89 N
X	-7.899 N	7.899 N
Y	-5.88 N	23.83 N
Z	-7.008 N	2.114 N
Strain		
Equivalent	5.448E-11	0.002906
1st Principal	4.596E-11	0.002469
3rd Principal	-0.002562	-4.838E-11
Normal XX	-7.113E-04	3.988E-04
Normal YY	-6.346E-04	3.705E-04
Normal ZZ	-1.903E-04	4.297E-04
Shear XY	-0.002444	0.001106
Shear YZ	-8.051E-04	8.813E-04
Shear ZX	-7.976E-04	6.724E-04
Contact Pressure		
Total	0 MPa	2.767 MPa
X	-1.513 MPa	1.818 MPa
Y	-2.474 MPa	1.565 MPa
Z	-1.225 MPa	0.4606 MPa

#### ☐ Reaction Forces

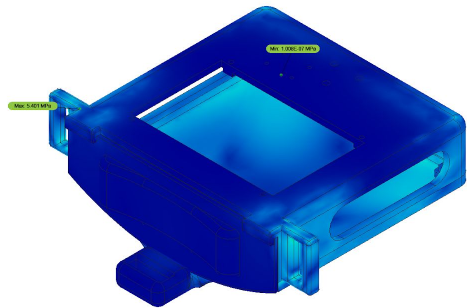
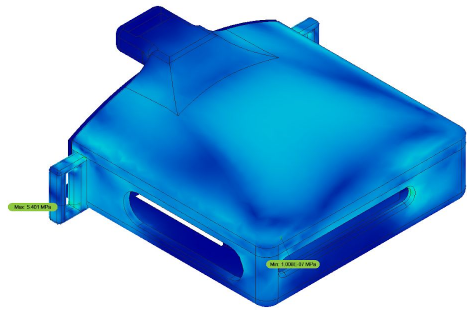
Constraint Name	Reaction Force		Reaction Moment	
	Magnitude	Component (X,Y,Z)	Magnitude	Component (X,Y,Z)

Fixed1	242.1 N	-0.05047 N	271 N mm	-254.9 N mm
		240.8 N		-19.09 N mm
		-25.04 N		89.94 N mm

☐ **Stress**

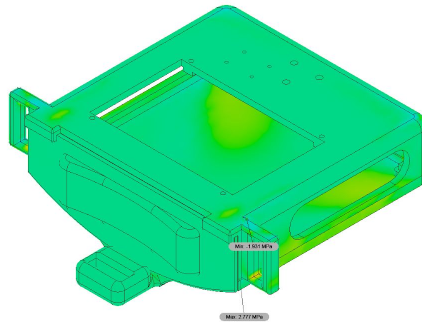
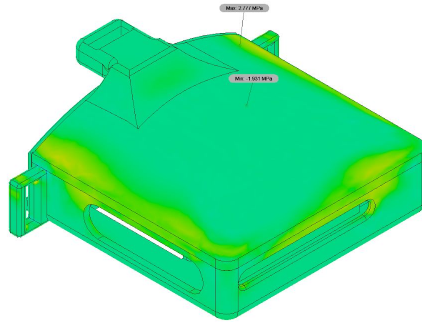
☐ **Von Mises**

[MPa] 0  5.401

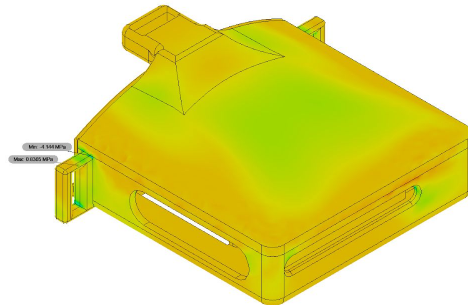


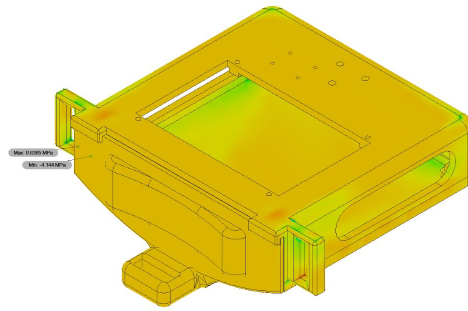
☐ **1st Principal**

[MPa] -1.931  2.777



☐ **3rd Principal**  
[MPa] -4.144 0.836

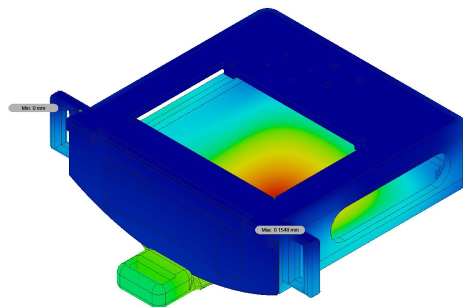
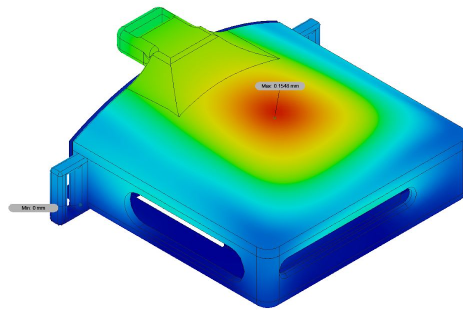




## Displacement

### Total

[mm] 0 0.1548

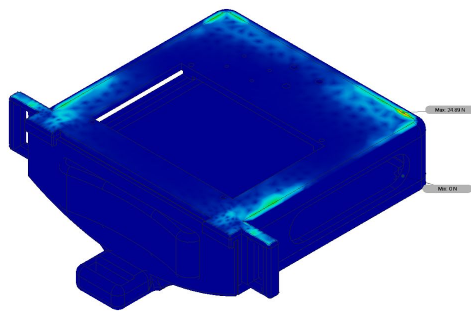
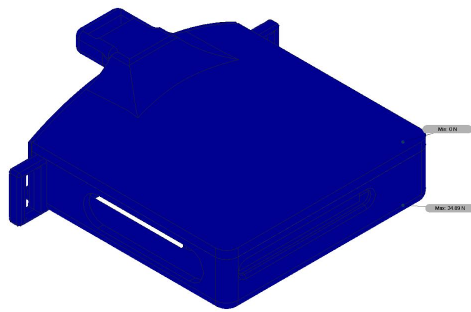


## Reaction Force



☐ **Total**

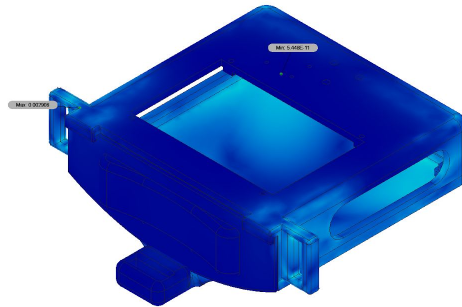
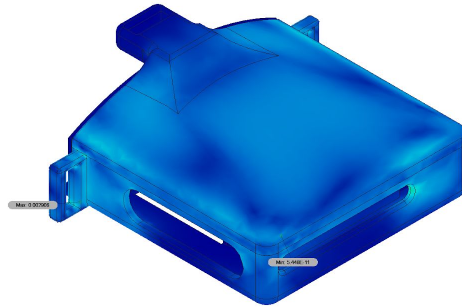
[N] 0  24.89



☐ **Strain**

☐ **Equivalent**

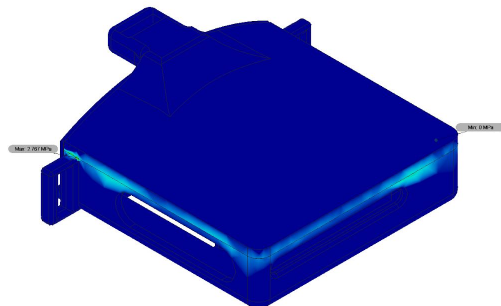
0  0.002906

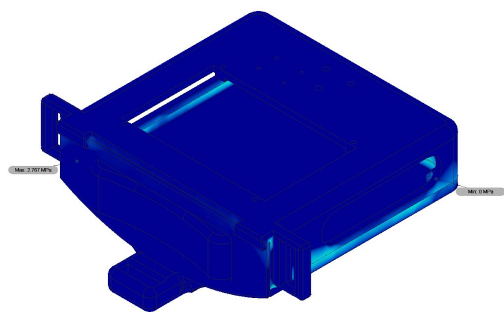


☐ **Contact Pressure**

☐ **Total**

[MPa] 0  2.767





---