

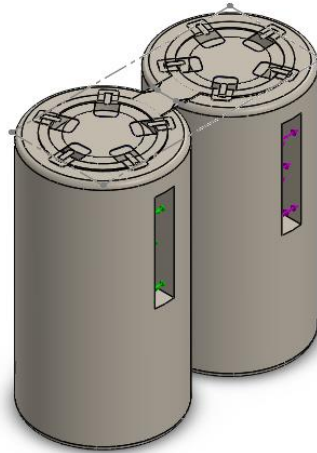
Simulation of Connector Assembly C

Date: Sunday, March 6, 2016
Designer: Solidworks
Study name: Horizontal Stress Test on C both bend
Analysis type: Static

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Model Information



Model name: Connector Assembly C
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
Cut-Extrude1 	Solid Body	Mass:0.19404 kg Volume:2.28282e-005 m ³ Density:8500 kg/m ³ Weight:1.90159 N	E:\Battery Connector\Parts\3D\Batter y C.SLDPRT Feb 18 10:32:52 2016
Cut-Extrude1 	Solid Body	Mass:0.19404 kg Volume:2.28282e-005 m ³ Density:8500 kg/m ³ Weight:1.90159 N	E:\Battery Connector\Parts\3D\Batter y C.SLDPRT Feb 18 10:32:52 2016



Study Properties

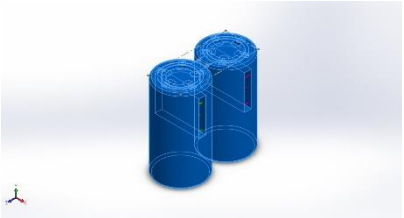
Study name	Horizontal Stress Test on C both bend
Analysis type	Static
Mesh type	Mixed Mesh
Thermal Effect:	On
Thermal option	Include temperature loads
Zero strain temperature	298 Kelvin
Include fluid pressure effects from SOLIDWORKS Flow Simulation	Off
Solver type	Automatic
Inplane Effect:	Off
Soft Spring:	On
Inertial Relief:	On
Incompatible bonding options	Automatic
Large displacement	Off
Compute free body forces	Off
Friction	Off
Use Adaptive Method:	Off
Result folder	SOLIDWORKS document (E:\Battery Connector\Assembly)

Units

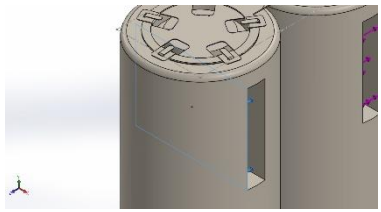
Unit system:	SI (MKS)
Length/Displacement	mm
Temperature	Kelvin
Angular velocity	Rad/sec
Pressure/Stress	N/m ²

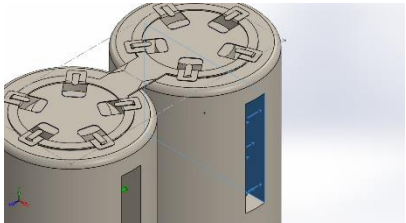


Material Properties

Model Reference	Properties	Components
	Name: Nickel Model type: Linear Elastic Isotropic Default failure criterion: Unknown Yield strength: 5.9e+007 N/m ² Tensile strength: 3.17e+008 N/m ² Elastic modulus: 2.1e+011 N/m ² Poisson's ratio: 0.31 Mass density: 8500 kg/m ³ Shear modulus: 7.9e+010 N/m ² Thermal expansion coefficient: 1.7e-005 /Kelvin	SolidBody 1(Flat-Pattern)(Barbell Connector C-1), SolidBody 1(Cut-Extrude1)(Battery C-1), SolidBody 1(Cut-Extrude1)(Battery C-2), SolidBody 1(Fold2)(Star Connector C 3D-1), SolidBody 1(Fold2)(Star Connector C 3D-2)
Curve Data:N/A		


Loads and Fixtures

Fixture name	Fixture Image	Fixture Details		
Fixed-1		Entities: 1 face(s) Type: Fixed Geometry		
Resultant Forces				
Components	X	Y	Z	Resultant
Reaction force(N)	0.00798087	-0.051057	-8.26838	8.26854
Reaction Moment(N.m)	0	0	0	1e-033

Load name	Load Image	Load Details
Force-1		Entities: 1 face(s) Type: Apply normal force Value: 250 N (56.2022 lbf)



Contact Information

Contact	Contact Image	Contact Properties
Global Contact		Type: Bonded Components: 1 component(s) Options: Compatible mesh

Mesh information

Mesh type	Mixed Mesh
Mesher Used:	Blended curvature-based mesh
Jacobian points	4 Points
Jacobian check for shell	On
Maximum element size	5.00541 mm
Minimum element size	1.00108 mm
Mesh Quality	High
Remesh failed parts with incompatible mesh	Off

Mesh information - Details

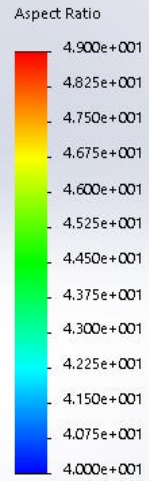
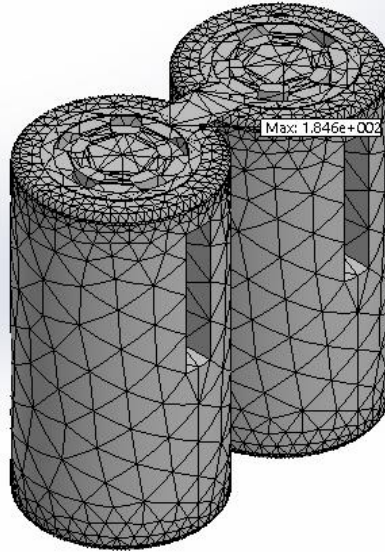
Total Nodes	18423
Total Elements	10226
Time to complete mesh(hh:mm:ss):	00:00:14
Computer name:	

Mesh Quality Plots

Name	Type	Min	Max
Mesh Quality1	Aspect Ratio	1.0834 Element: 95	184.625 Element: 3



Model name:Connector Assembly C
 Study name:Horizontal Stress Test on C both bend(-Default-)
 Plot type: Aspect ratio Mesh Quality1
 Global value: 1.0834 to 184.625



Connector Assembly C-Horizontal Stress Test on C both bend-Mesh Quality-Mesh Quality1

Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	0.00798087	-0.051057	-8.26838	8.26854

Reaction Moments

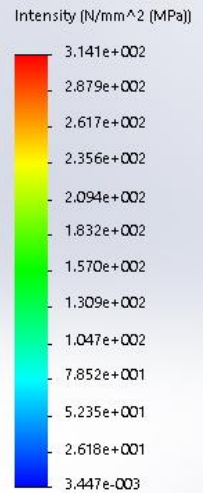
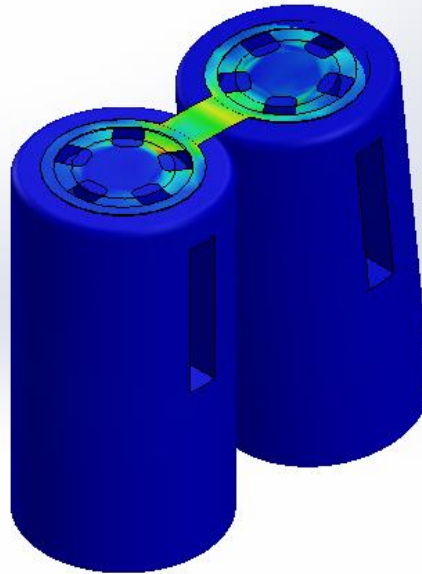
Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	1e-033



Study Results

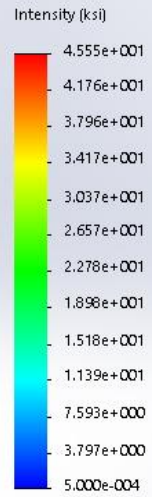
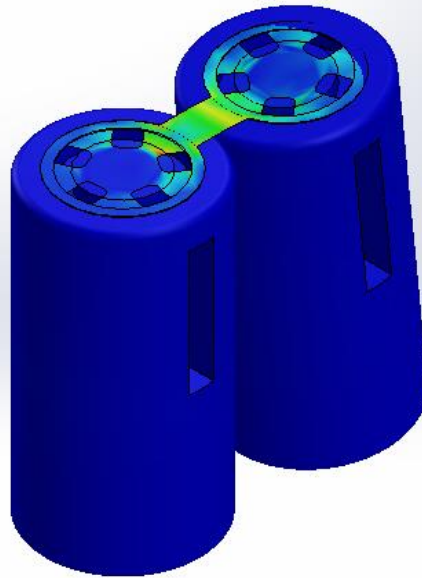
Name	Type	Min	Max
Stress	INT: Stress Intensity(P1-P3)	0.0034471 MPa Or 0.000499959 ksi	314.082 MPa Or 45.5538 ksi
		Node: 2186	Node: 228

Model name: Connector Assembly C
 Study name: Horizontal Stress Test on C both bend-(Default)
 Plot type: Static nodal stress Stress1
 Deformation scale: 5.30172



Connector Assembly C-Horizontal Stress Test on C both bend-Stress-Stress (MPa)

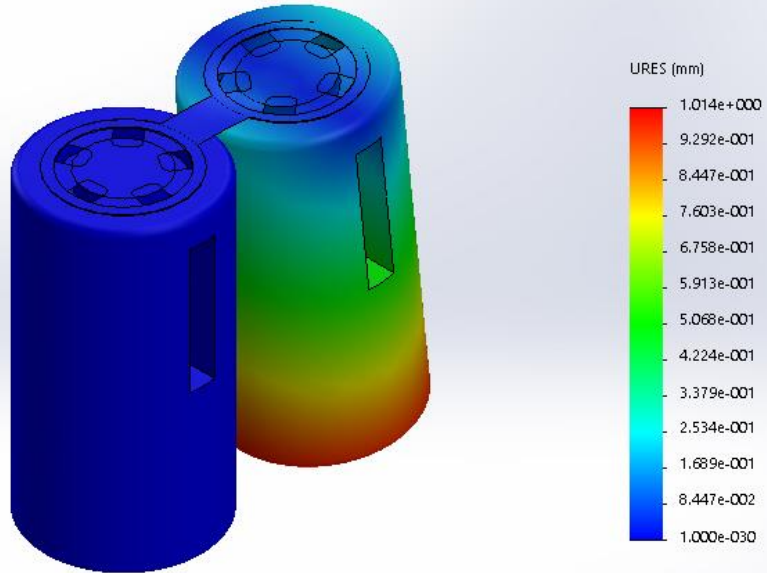
Model name: Connector Assembly C
 Study name: Horizontal Stress Test on C both bend(Default-)
 Plot type: Static nodal stress Stress1
 Deformation scale: 5.30172



Connector Assembly C-Horizontal Stress Test on C both bend-Stress-Stress (ksi)

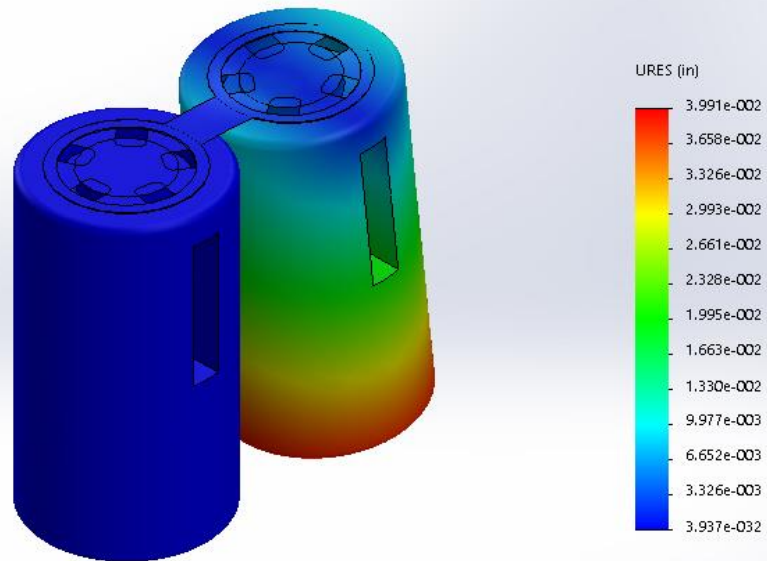
Name	Type	Min	Max
Displacement	URES: Resultant Displacement	0 mm Or 0 in	1.0137 mm Or 0.0399093 in
		Node: 716	Node: 11127

Model name: Connector Assembly C
 Study name: Horizontal Stress Test on C both bend(-Default-)
 Plot type: Static displacement Displacement1
 Deformation scale: 5.30172



Connector Assembly C-Horizontal Stress Test on C both bend-Displacement-Displacement (mm)

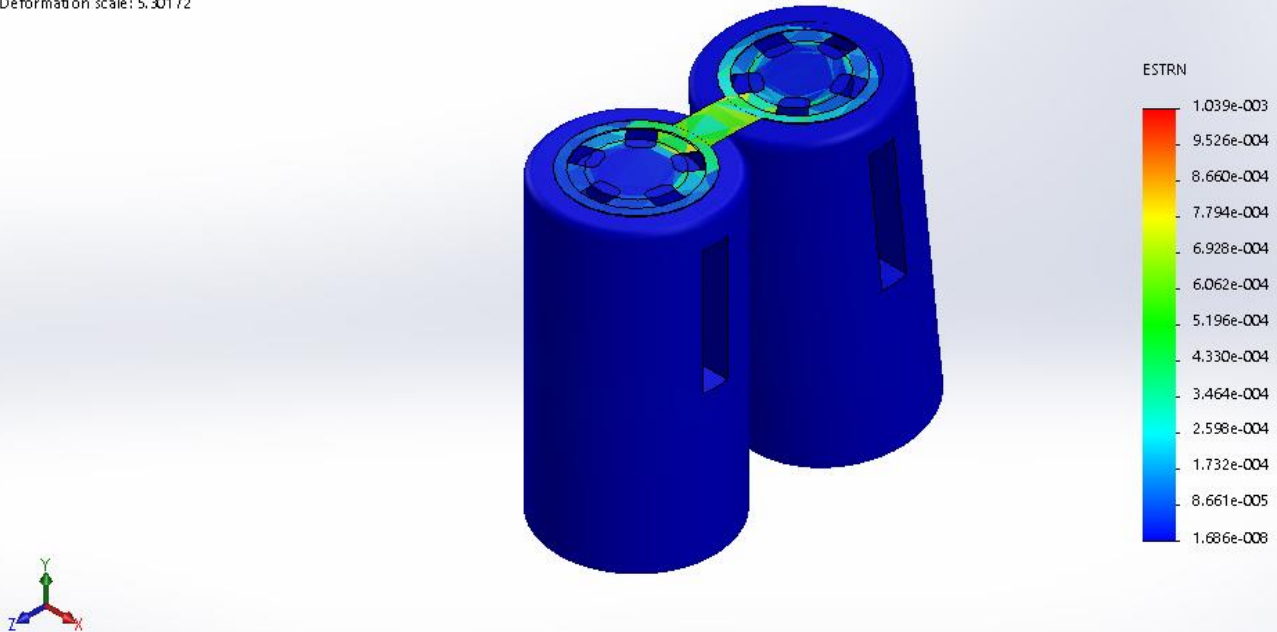
Model name: Connector Assembly C
 Study name: Horizontal Stress Test on C both bend(-Default-)
 Plot type: Static displacement Displacement1
 Deformation scale: 5.30172



Connector Assembly C-Horizontal Stress Test on C both bend-Displacement-Displacement (in)

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	1.68646e-008	0.00103915

Model name: Connector Assembly C
Study name: Horizontal Stress Test on C both bend(-Default-)
Plot type: Static strain Strain1
Deformation scale: 5.30172



Connector Assembly C-Horizontal Stress Test on C both bend-Strain-Strain1

Conclusion

The application of 250 N (56.2022 lbf) force yields a maximum stress of 314.082 MPa (45.5538 ksi) with a maximum material displacement of 1.0137 mm (0.0399093 in) in the connector assembly. So it is safe to assume that the set up will bear a load of 250 N (56.2022 lbf) safely.

