L gull 10 cm

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1. Introduction

10 cm long

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2. File Information

Model name:	L gull
Model location:	C:\Documents and Settings\Howard Wieman\My Documents\aps project\mechanical\ladder thermal thin 3\L gull.SLDASM
Results location:	C:\Program Files\SolidWorks\COSMOS\work
Study	solid 10 sym (-Default-)

name:

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3. Materials

No.	Part Name	Material	Mass	Volume
1	L acrylic-1	[SW]acrylic adhesive	6.49636e-005 kg	5.588e-008 m^3
2	L acrylic-2	[SW]acrylic adhesive	6.49636e-005 kg	5.588e-008 m^3
3	L cable-1	[SW]cable mix no adhesive	0.000250574 kg	1.50876e-007 m^3
4	L cap-1	[SW]ladder carbon corrected	0.000221661 kg	1.43e-007 m^3
5	L gull-1	[SW]ladder carbon corrected	0.000335247 kg	2.16278e-007 m^3
6	L silicon-1	[SW]silicon D	0.000127881 kg	5.5e-008 m^3

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4. Load & Restraint Information

Restraint	
Restraint-1 <L gull-1>	on **1 Vertex(s)** fixed.
Description:	
Restraint-2 <L gull-1>	on **1 Vertex(s)** with respect to reference geometry **Front** with displacement **0 m** along plane Dir 2 displacement **0 m** normal to reference plane

Description:	
Restraint-3 <L silicon-1, L acrylic-1, L cable-1, L acrylic-2, L cap-1, L gull-1>	on **6 Face(s)** symmetry
Description:	
Restraint-4 <L silicon-1, L acrylic-1, L cable-1, L acrylic-2, L cap-1, L gull-1>	on **6 Face(s)** symmetry
Description:	

Load	
Temperature-1 <L silicon-1, L acrylic-1, L cable-1, L acrylic-2, L cap-1, L gull-1>	on **6 Component(s)** with temperature **320 Kelvin**
Description:	

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5. Study Property

Mesh Information	
Mesh Type:	Solid mesh
Mesher Used:	Standard
Automatic Transition:	Off
Smooth Surface:	On
Jacobian Check:	4 Points
Element Size:	0.087845 cm
Tolerance:	0.0043923 cm
Quality:	High
Number of elements:	59463

Number of nodes:	93825
Time to complete mesh(hh;mm;ss):	00:01:11
Computer name:	WIEMAN-M90

Solver Information	
Quality:	High
Solver Type:	FFEPlus
Option:	Include Thermal Effects
Thermal Option:	Input Temperature
Thermal Option:	Reference Temperature at zero strain: 300 Kelvin

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6. Contact

Contact state: Touching faces - Bonded

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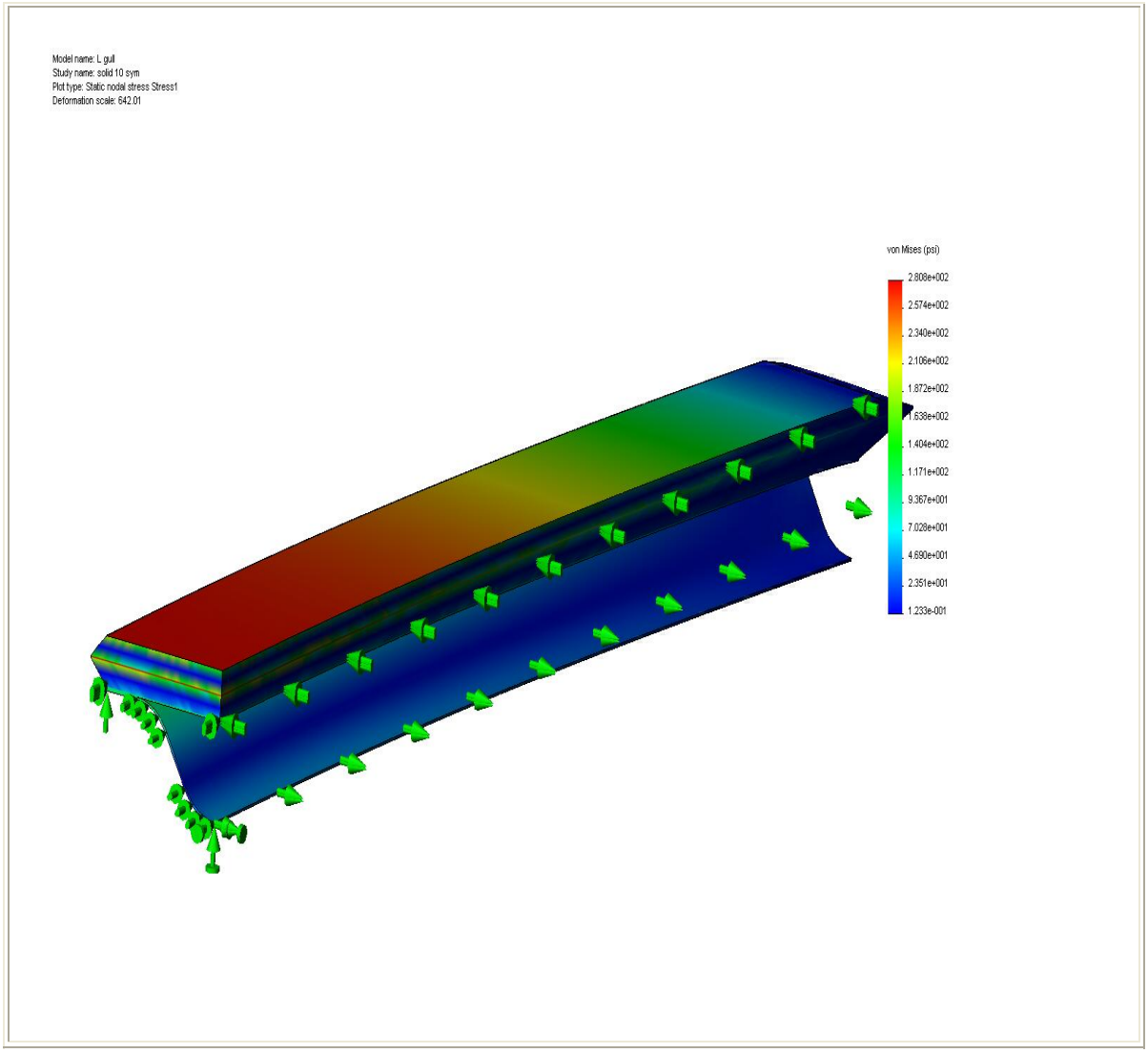
7. Results

7a. Default Results

Name	Type	Min	Location	Max	Location
Stress1	VON: von Mises stress	0.123329 psi Node: 47750	(1.1 cm, -0.011938 cm, 5 cm)	280.755 psi Node: 47364	(1.07297 cm, -0.00776868 cm, -4.92485 cm)
Displacement1	URES: Resultant displacement	0 m Node: 61177	(-3.86622e-016 cm, -0.652876 cm, -5 cm)	1.61344e-005 m Node: 243	(1.1 cm, -0.00508 cm, 5 cm)
Displacement2	UY: Y Displacement	-5.71563e-006 m Node: 48851	(1.04092e-015 cm, -0.036876 cm, 5 cm)	4.52218e-006 m Node: 80319	(0 cm, 0.005 cm, -5 cm)

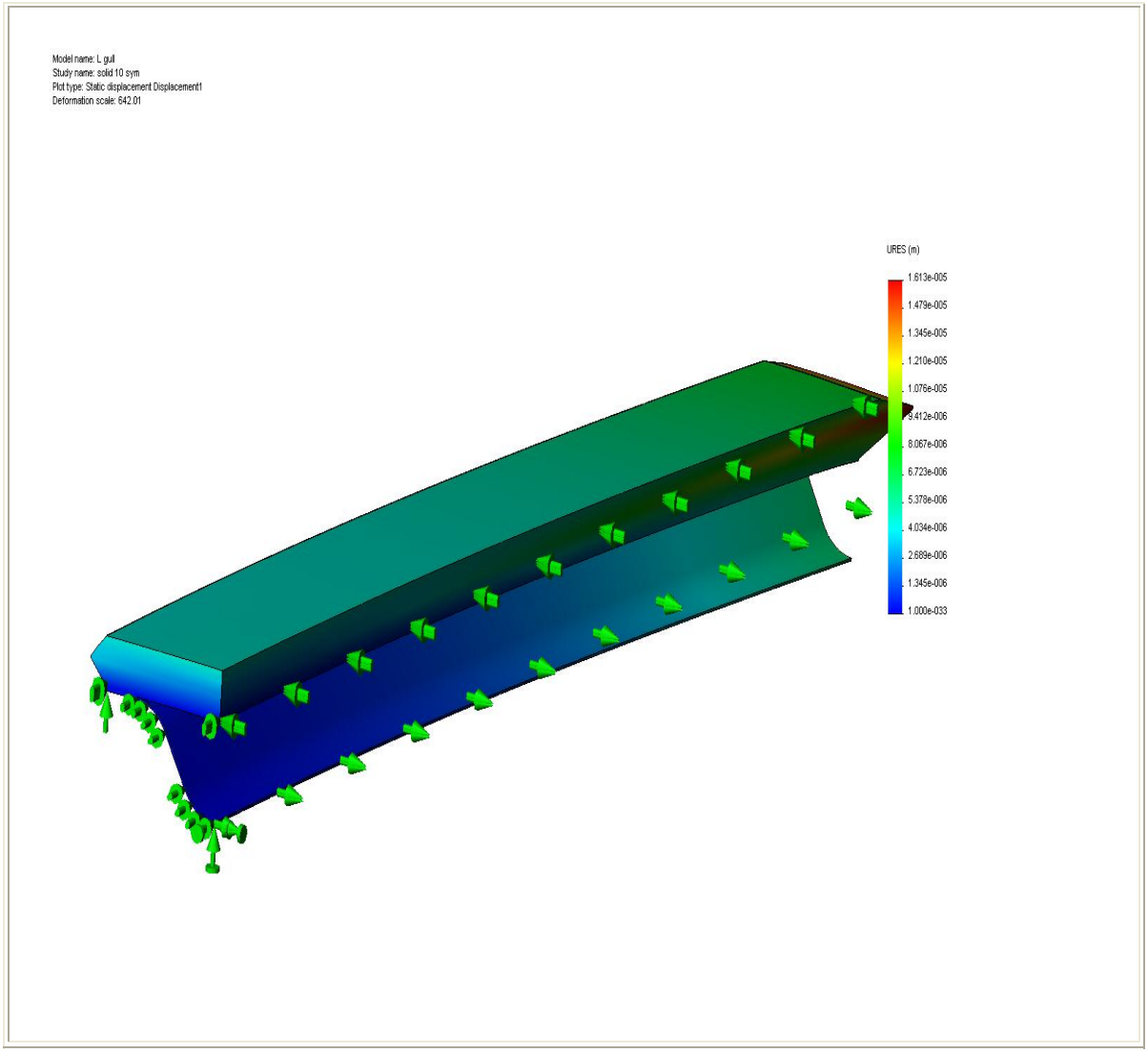
L gull-solid 10 sym-Stress-Stress1

JPEG



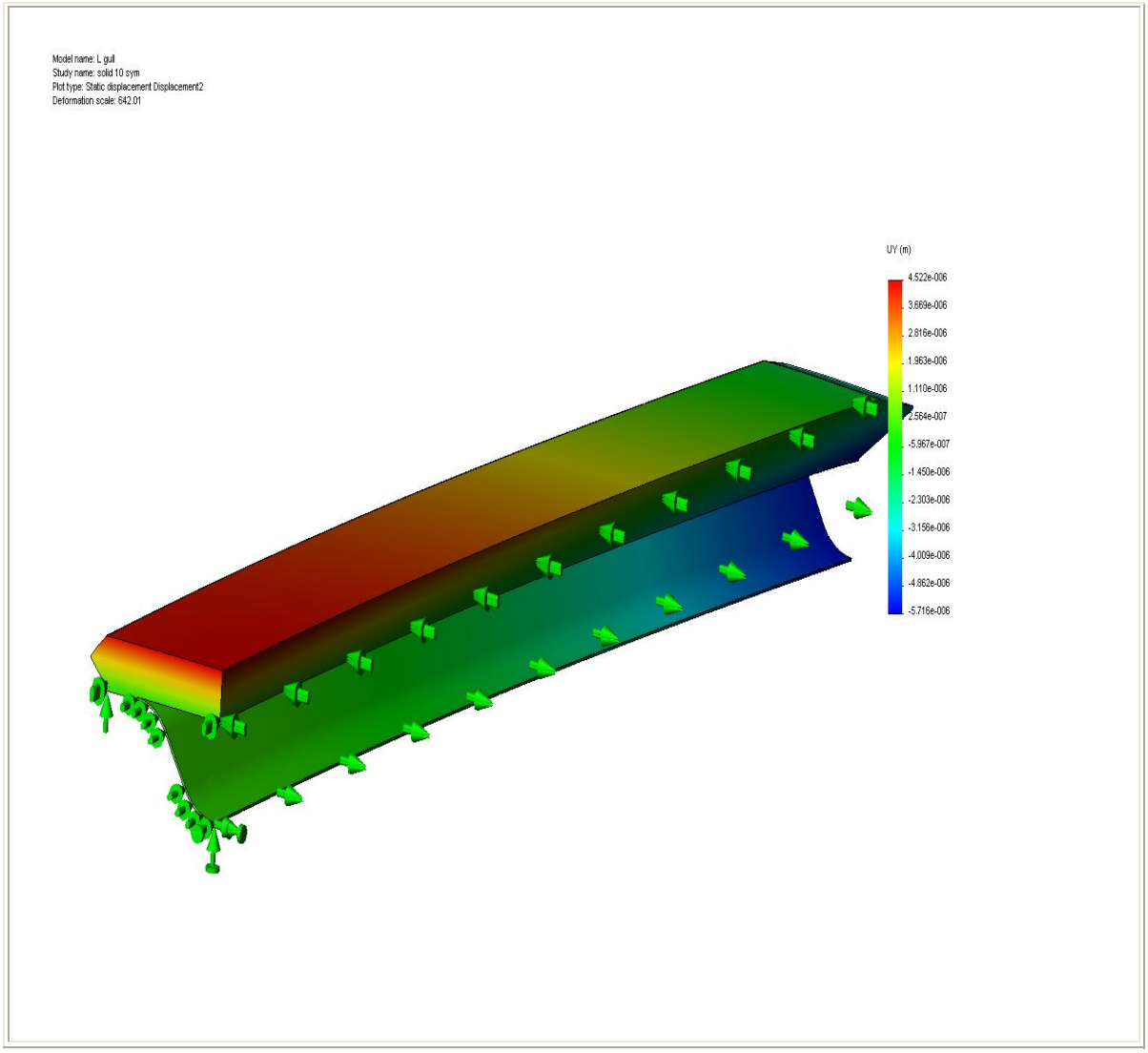
L gull-solid 10 sym-Displacement-Displacement1

JPEG



L gull-solid 10 sym-Displacement-Displacement2

JPEG



8. Appendix

Material name: [SW]acrylic adhesive

Description:

Material Source: Used SolidWorks material

Material Library Name: carbon composite tube

Material Model Type: Linear Elastic Isotropic

Property Name	Value	Units	Value Type
Elastic modulus	44816	N/m^2	Constant
Poisson's ratio	0.49	NA	Constant
Shear modulus	15169	N/m^2	Constant
Mass density	1162.6	kg/m^3	Constant
Tensile strength	3.5163e+005	N/m^2	Constant
Yield strength	3.5163e+005	N/m^2	Constant
Thermal expansion coefficient	0.00072	/Kelvin	Constant
Thermal conductivity	0.17	W/(m.K)	Constant
Specific heat	1400	J/(kg.K)	Constant

Material name: [SW]cable mix no adhesive

Description:

Material Source: Used SolidWorks material

Material Library Name: carbon composite tube

Material Model Type: Linear Elastic Isotropic

Property Name	Value	Units	Value Type
Elastic modulus	2.0684e+010	N/m^2	Constant
Poisson's ratio	0.34	NA	Constant
Shear modulus	1.1032e+010	N/m^2	Constant
Mass density	1660.8	kg/m^3	Constant
Tensile strength	8.2392e+008	N/m^2	Constant
Yield strength	4.7367e+008	N/m^2	Constant
Thermal expansion coefficient	1.1e-005	/Kelvin	Constant
Thermal conductivity	0.2	W/(m.K)	Constant
Specific heat	1175	J/(kg.K)	Constant

Material name: [SW]ladder carbon corrected

Description:

Material Source: Used SolidWorks material

Material Library Name: carbon composite tube

Material Model Type: Linear Elastic Isotropic

Property Name	Value	Units	Value Type
Elastic modulus	1.3996e+011	N/m^2	Constant
Poisson's ratio	0.33	NA	Constant
Shear modulus	7.0396e+010	N/m^2	Constant
Mass density	1550.1	kg/m^3	Constant
Tensile strength	1.8961e+009	N/m^2	Constant
Yield strength	1.2273e+009	N/m^2	Constant
Thermal expansion coefficient	1e-006	/Kelvin	Constant
Thermal conductivity	46	W/(m.K)	Constant
Specific heat	920	J/(kg.K)	Constant

Material name: [SW]silicon D

Description:

Material Source: Used SolidWorks material

Material Library Name: carbon composite tube

Material Model Type: Linear Elastic Isotropic

Property Name	Value	Units	Value Type
Elastic modulus	1.1032e+011	N/m^2	Constant
Poisson's ratio	0.28	NA	Constant
Shear modulus	4.8953e+010	N/m^2	Constant
Mass density	2325.1	kg/m^3	Constant
Tensile strength	1.1997e+008	N/m^2	Constant
Yield strength	1.1997e+008	N/m^2	Constant
Thermal expansion coefficient	3e-006	/Kelvin	Constant
Thermal conductivity	124	W/(m.K)	Constant

Specific heat	700	J/(kg.K)	Constant