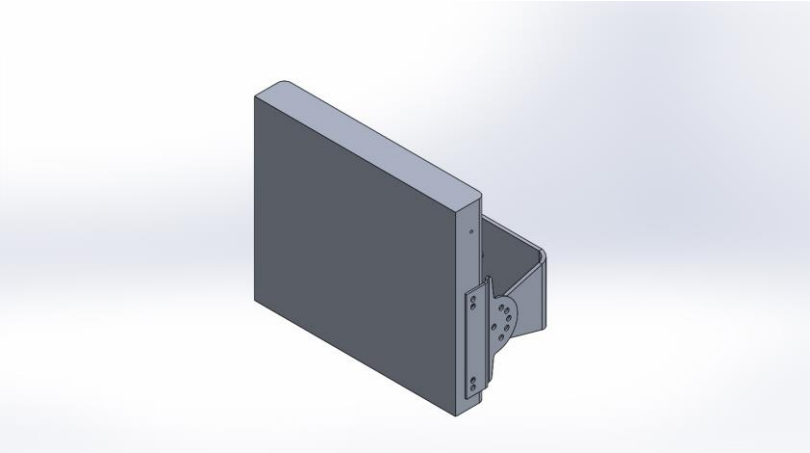
Larson Electronics LLC
9419 E US Highway 175
Kemp, TX 75143
Phone: 1-903-498-3364
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https://www.larsonelectronics.com/



Simulation of EPL-HB-Test Fixture

Date: Monday, September 10, 2018
Designer: Luis Martinez
Study name: 5g
Analysis type: Linear dynamic analysis (Random Vibration)

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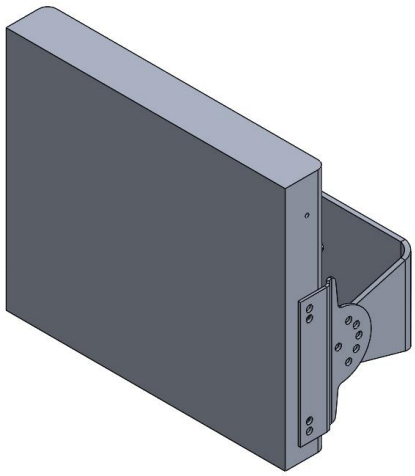
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Description

No Data

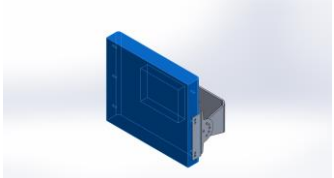
Assumptions

Model Information



Model name: EPL-HB-Test Fixture
Current Configuration: Beefy Trunnion

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
Fillet1 	Solid Body	**Mass:24.9748 kg** **Volume:0.00924994 m^3** **Density:2700 kg/m^3** **Weight:244.754 N**	**Z:\cad\CAD-Vault\Archive\EPL\EPL-HB-150LED-RT\CAD Files\Test Light.SLDPRT** Aug 31 11:37:49 2018

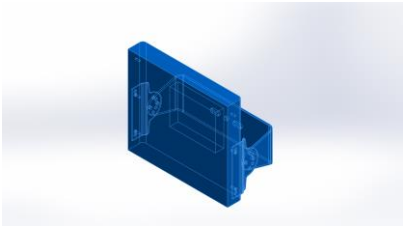
Study Properties

Study name	5g
Analysis type	Linear dynamic analysis (Random Vibration)
Mesh type	Mixed Mesh
Number of frequencies	15
Solver type	FFEPlus
Soft Spring:	Off
Incompatible bonding options	Automatic
Thermal option	Include temperature loads
Zero strain temperature	298 Kelvin
Include fluid pressure effects from SOLIDWORKS Flow Simulation	Off
Lower frequency limit	0 Hz
Upper frequency limit	0 Hz
Number of output frequencies	10
Correlation	Fully correlated
Result folder	SOLIDWORKS document (Z:\cad\CAD-Vault\Archive\EPL\EPL-HB-150LED-RT\CAD Files\Vibration Test)

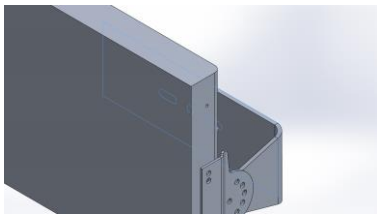
Units

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

Material Properties

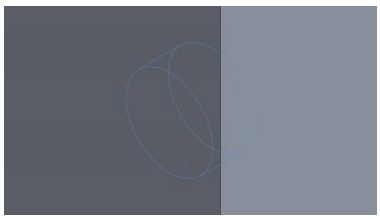
Model Reference	Properties	Components
	**Name:** 6061-T6 (SS) **Model type:** Linear Elastic Isotropic **Default failure criterion:** Unknown **Yield strength:** 2.75e+008 N/m^2 **Tensile strength:** 3.1e+008 N/m^2 **Elastic modulus:** 6.9e+010 N/m^2 **Poisson's ratio:** 0.33 **Mass density:** 2700 kg/m^3 **Shear modulus:** 2.6e+010 N/m^2 **Thermal expansion coefficient:** 2.4e-005 /Kelvin	SolidBody 1(Fillet2)(Bracket-1), SolidBody 1(Cut-Extrude1)(EPL-HB-150LED-RT bracket short-1), SolidBody 1(Cut-Extrude1)(EPL-HB-150LED-RT bracket short-2), SolidBody 1(Fillet1)(Test Light-1)
Curve Data:N/A		

Loads and Fixtures

Fixture name	Fixture Image	Fixture Details
Roller/Slider-1		**Entities:** 1 face(s) **Type:** Roller/Slider

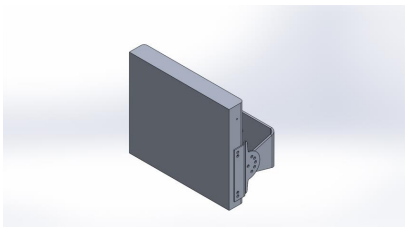
Resultant Forces

Components	X	Y	Z	Resultant
Reaction force(N)	1147.26	121110	1.69061e+007	1.69066e+007
Reaction Moment(N.m)	0	0	0	1e-033

Fixture name	Fixture Image	Fixture Details
On Cylindrical Faces-1		**Entities:** 1 face(s) **Type:** On Cylindrical Faces **Translation:** 0, 0 rad., --- **Rotation:** ---, ---, --- **Units:** mm, rad

Resultant Forces

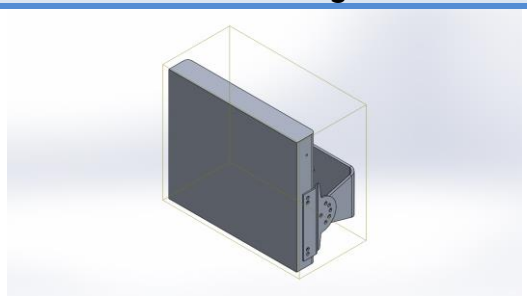
Components	X	Y	Z	Resultant
Reaction force(N)	1147.15	121109	9.65112e-023	121115
Reaction Moment(N.m)	0	0	0	1e-033

Load name	Load Image	Load Details
Base Excitation-1		**Type:** Acceleration **Translation:** ---, -25, --- **Units:** in, rad **Phase Angle:** 0 **Units:** deg

Connector Definitions

No Data

Contact Information

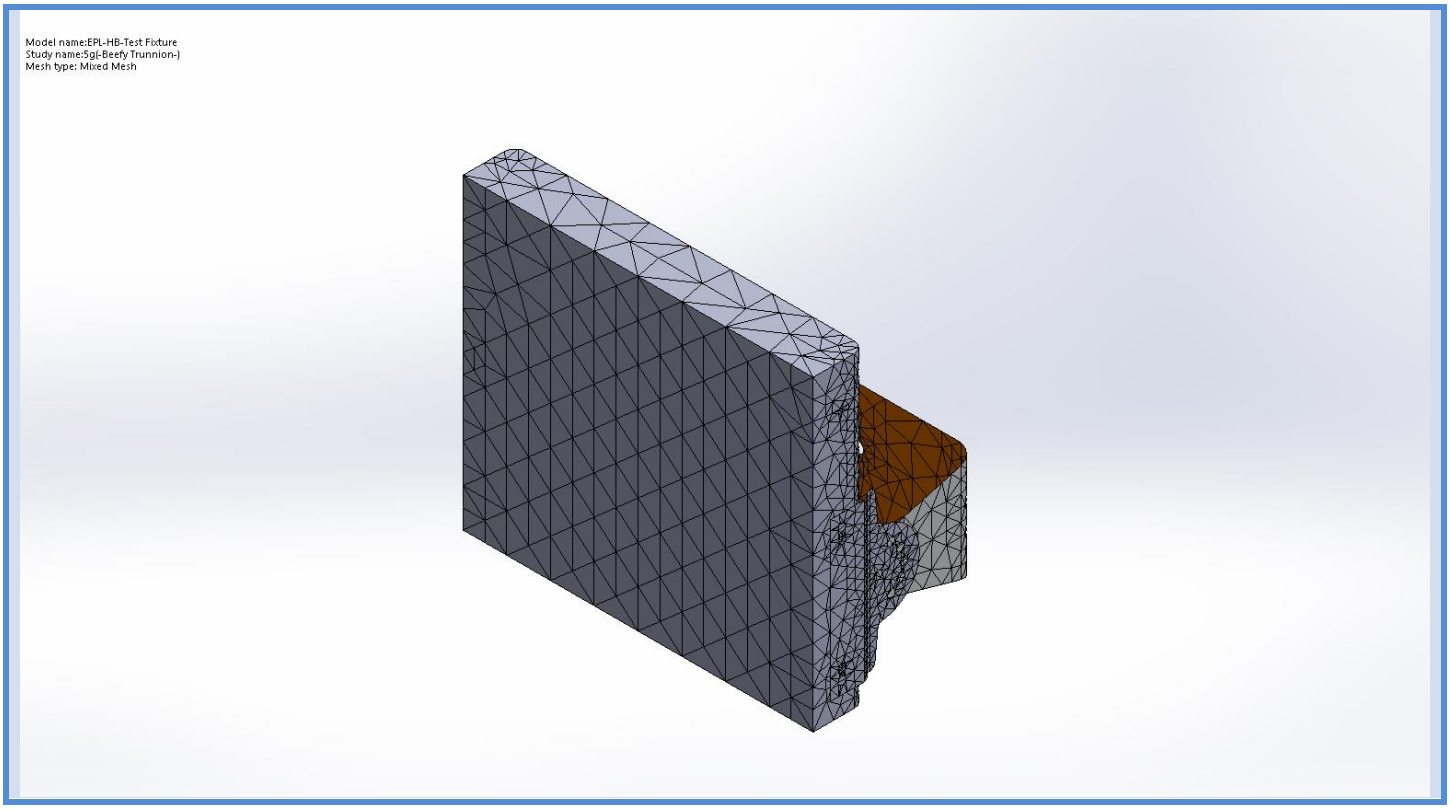
Contact	Contact Image	Contact Properties
Global Contact		**Type:** Bonded **Components:** 1 component(s) **Options:** Compatible mesh

Mesh information

Mesh type	Mixed Mesh
Mesher Used:	Curvature-based mesh
Jacobian points	4 Points
Jacobian check for shell	On
Maximum element size	1.65314 in
Minimum element size	0.330629 in
Mesh Quality	High
Remesh failed parts with incompatible mesh	Off

Mesh information - Details

Total Nodes	15815
Total Elements	9318
Time to complete mesh(hh;mm;ss):	00:00:07
Computer name:	FABR002

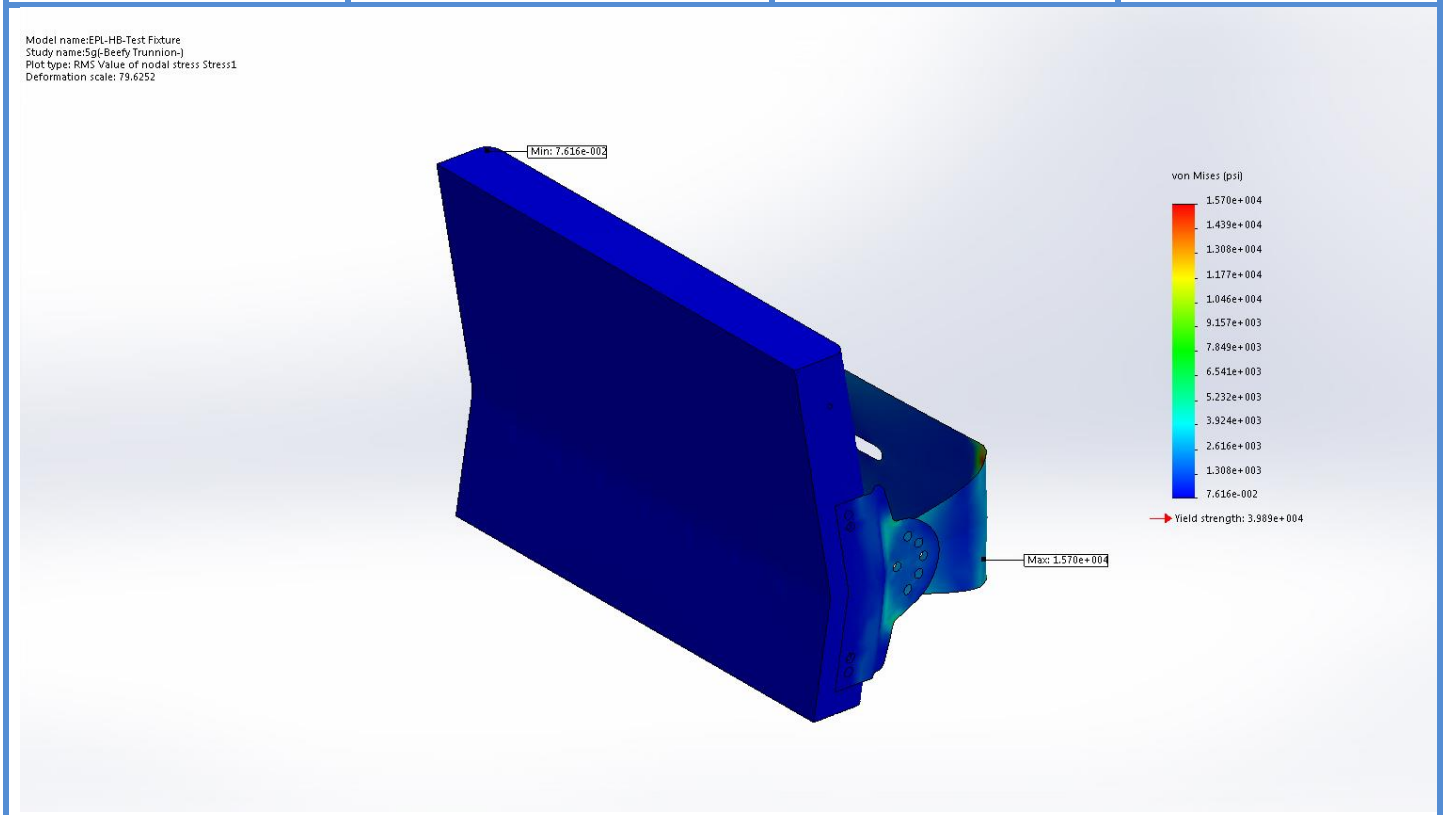


Sensor Details

No Data

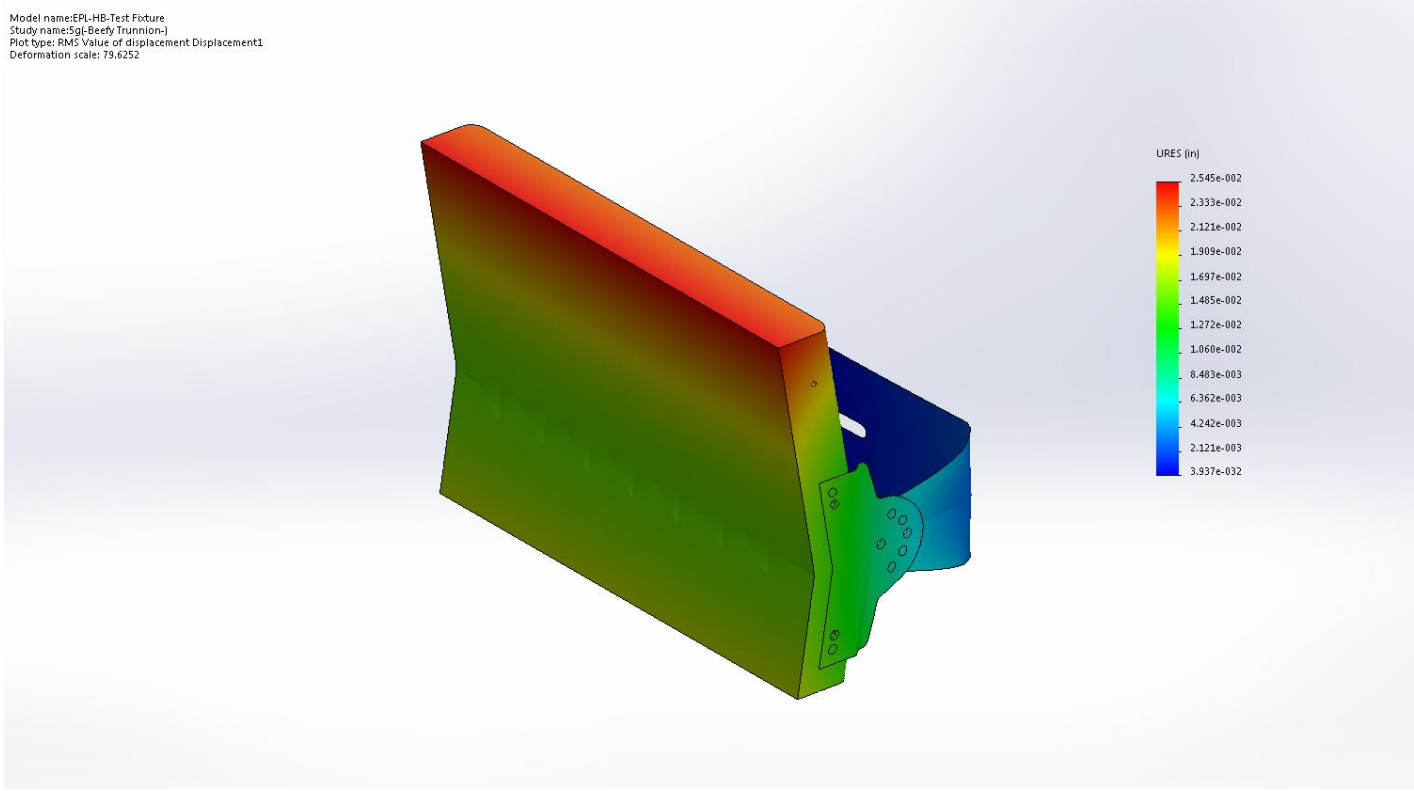
Study Results

Name	Type	Min	Max
Stress1	VON: von Mises Stress	0.0761646 psi Node: 6866	15697.2 psi Node: 27



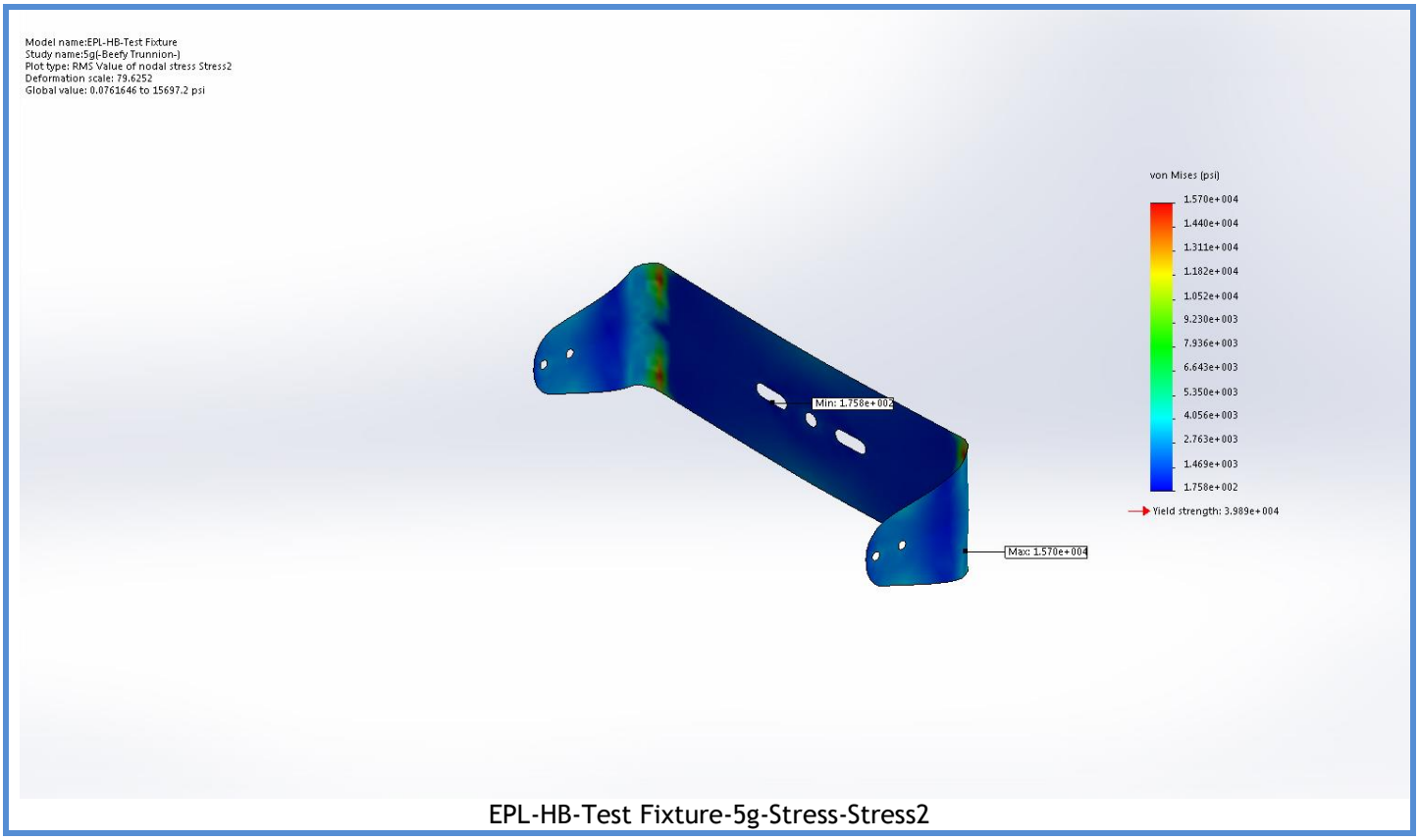
EPL-HB-Test Fixture-5g-Stress-Stress1

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0 in Node: 53	0.0254498 in Node: 3338



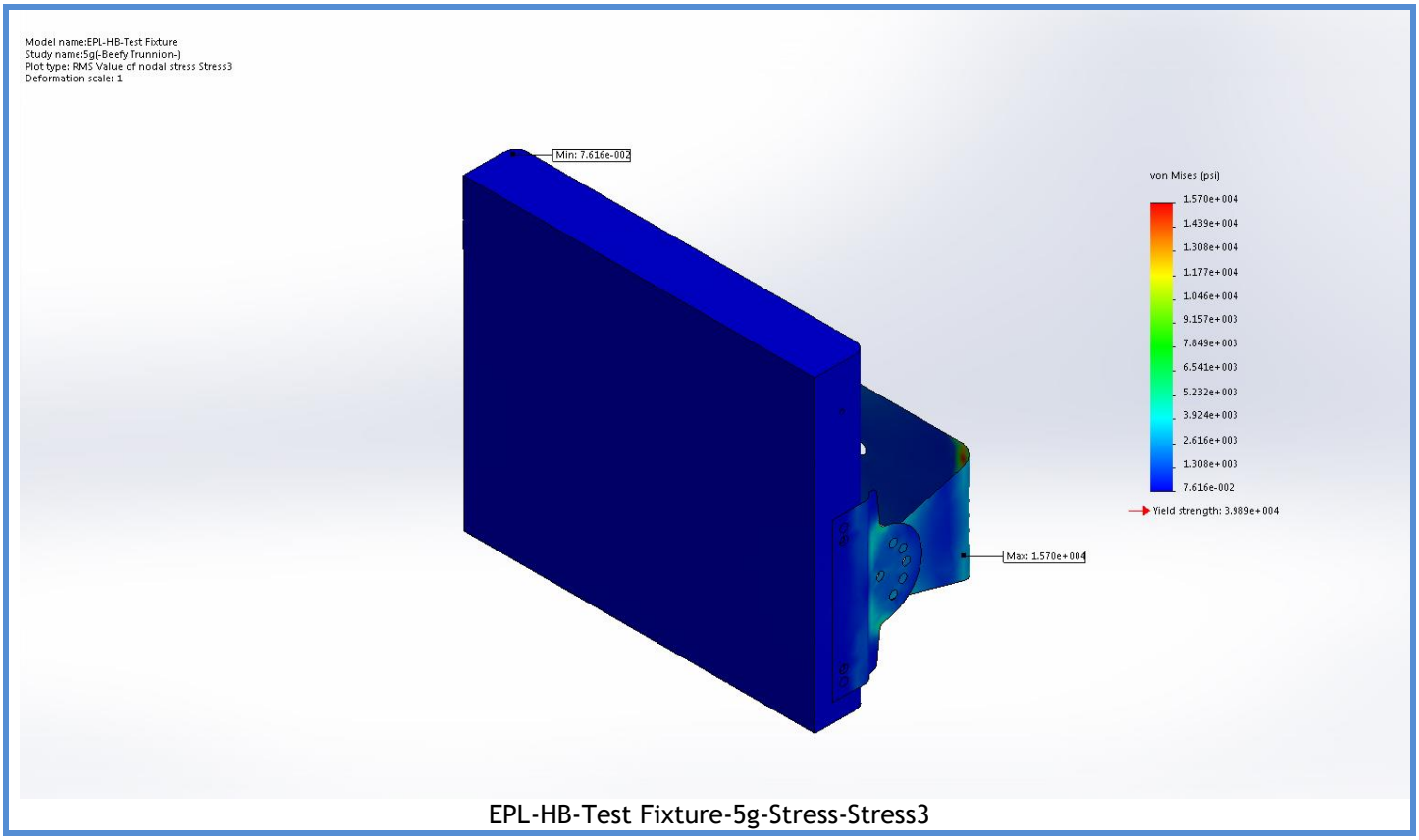
EPL-HB-Test Fixture-5g-Displacement-Displacement1

Name	Type	Min	Max
Stress2	VON: von Mises Stress	0.0761646 psi Node: 6866	15697.2 psi Node: 27



EPL-HB-Test Fixture-5g-Stress-Stress2

Name	Type	Min	Max
Stress3	VON: von Mises Stress	0.0761646 psi Node: 6866	15697.2 psi Node: 27



EPL-HB-Test Fixture-5g-Stress-Stress3

Mass Participation (Normalized)

Mode Number	Frequency(Hertz)	X direction	Y direction	Z direction
1	22.547	0.95703	8.5132e-010	6.3175e-009
2	63.498	0.0037041	2.4049e-005	1.4368e-005
3	71.174	1.7485e-007	0.42649	0.16448
4	171.23	6.1361e-009	0.54242	0.20101
5	360.71	7.3137e-007	0.0072868	0.58607
6	514.59	0.0019099	5.0829e-008	0.00021833
7	1080	0.00089179	9.1365e-008	0.0044357
8	1088.8	0.0031256	1.6753e-007	0.001243

9	1205.6	4.4134e-005	5.1714e-007	1.7055e-007
10	1515.3	3.481e-005	1.8454e-007	2.231e-007
11	1734.7	2.2203e-008	0.0082392	5.2314e-007
12	2121.5	8.3684e-009	1.7795e-005	0.0013939
13	2518.6	9.616e-006	0.00027241	1.7573e-006
14	2563.2	7.1295e-007	0.0021124	7.9589e-006
15	2812.4	1.2566e-007	0.0010881	6.736e-006
		Sum X = 0.96675	Sum Y = 0.98795	Sum Z = 0.95888

Conclusion