OXFORD

CLIQR – DEVICE ADAPTORS

SIMULATION OF PHONE MOUNT (2.1)

STATIC TEST

LAST UPDATED: 27/08/20

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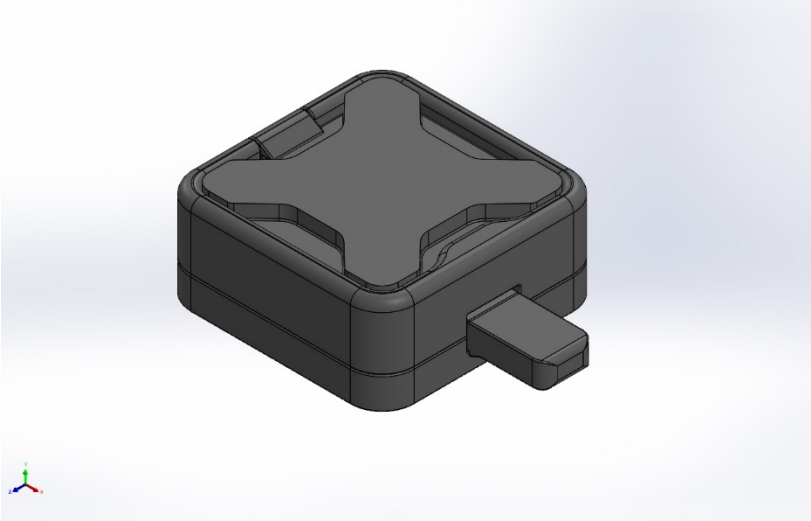
https://www.oxfordproducts.com/



Simulation of phone mount 2.1

Date: 09 March 2020
Study Designer: Kristian Doe
Study name: Phone mount 2.1 Static_01
Analysis type: Static

Table of Contents

Description

Static test of Oxford Cliqr adaptor fitted in phone mount 2.1
To demonstrate a ‘Dynamic normal tensile’ test.

The values in this test do not represent real life use. They serve as an advisory to aid in research and development. Further data is available to demonstrate the product is fit for use.

Refer to 3M tensile testing, including 90 degree peel adhesion and dynamic overlap sheer.

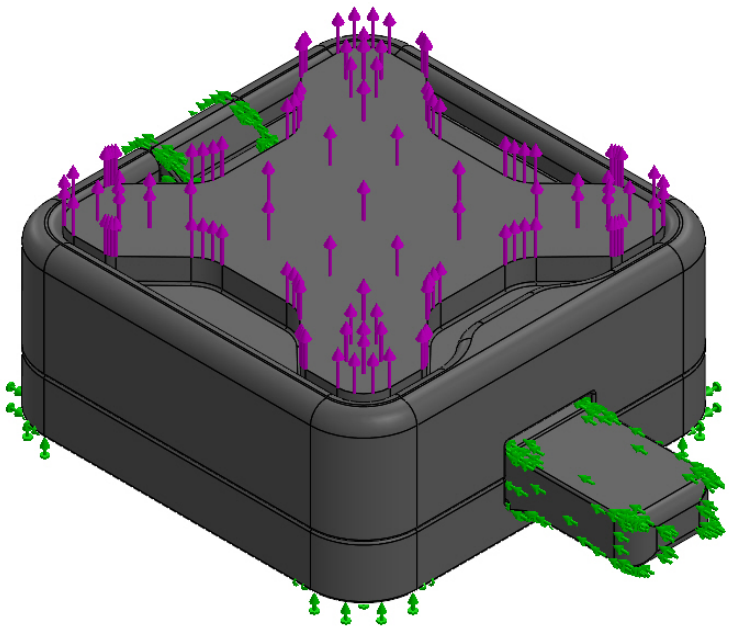
Also refer to Oxford internal tensile testing for dynamic normal tensile strength.

Assumptions

-The spring reaction force is consistent

-There is no leverage

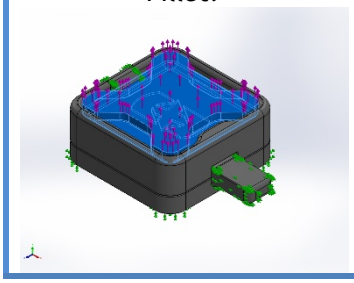
-There is no peeling



Model name: phone mount for simulation
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
Fillet22	Solid Body	**Mass:0.00496271 kg Volume:4.43099e-06 m^3 Density:1,120 kg/m^3 Weight:0.0486346 N**	**S:\Purchasing\Technical Design Files\Motorcycle\Cliqr Phone Mount range\OX851_Cliqr cable tie mount\CAD\Final CAD files\body lower 2.3.SLDPRT** Mar 9 11:13:24 2020
Cut-Extrude17	Solid Body	**Mass:0.00682761 kg Volume:6.09608e-06 m^3 Density:1,120 kg/m^3 Weight:0.0669106 N**	**S:\Purchasing\Technical Design Files\Motorcycle\Cliqr Phone Mount range\OX851_Cliqr cable tie mount\CAD\Final CAD files\body upper 2.2 .SLDPRT** Mar 9 11:13:25 2020

Fillet40	Solid Body	**Mass:0.00148889 kg Volume:1.32937e-06 m^3 Density:1,120 kg/m^3 Weight:0.0145911 N**	**S:\Purchasing\Technical Design Files\Motorcycle\Cliqr Phone Mount range\OX851_Cliqr cable tie mount\CAD\Final CAD files\moving lock 2.1 .SLDPRT** Nov 4 08:23:49 2019
Fillet9 	Solid Body	**Mass:0.0031555 kg Volume:2.81741e-06 m^3 Density:1,120 kg/m^3 Weight:0.0309239 N**	**S:\Purchasing\Technical Design Files\Motorcycle\Cliqr Phone Mount range\OX851_Cliqr cable tie mount\CAD\Final CAD files\phone section 2.4 .SLDPRT** Mar 9 08:55:13 2020

-Travel is consistent

-The base of the mount is fixed

-

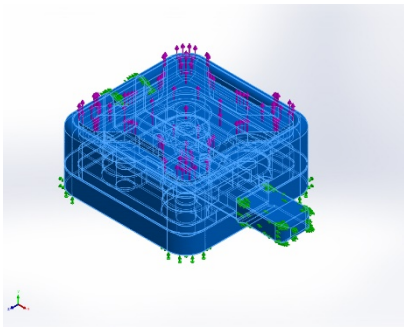
Study Properties

Study name	Phone mount 2.1 Static_01
Analysis type	Static
Mesh type	Solid 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	FFEPlus
Inplane Effect:	Off
Soft Spring:	Off
Inertial Relief:	Off
Incompatible bonding options	Automatic
Large displacement	Off
Compute free body forces	On
Friction	Off
Use Adaptive Method:	Off
Result folder	N/A

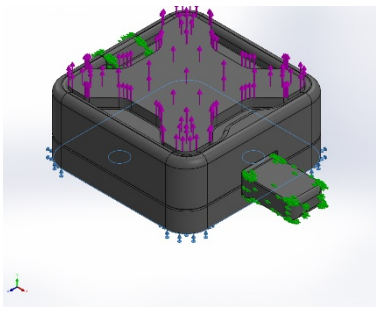
Units

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

Material Properties

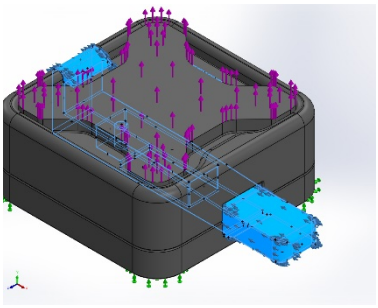
Model Reference	Properties		Components
	**Name:** **Model type:** **Default failure criterion:** **Yield strength:** **Tensile strength:** **Elastic modulus:** **Poisson's ratio:** **Mass density:** **Shear modulus:**	PA Type 6 Linear Elastic Isotropic Max von Mises Stress 1.03649e+08 N/m^2 9e+07 N/m^2 2.62e+09 N/m^2 0.34 1,120 kg/m^3 9.704e+08 N/m^2	SolidBody 1(Fillet22)(phone mount - 2.2-1/body lower 2.3-1), SolidBody 1(Cut-Extrude17)(phone mount - 2.2-1/body upper 2.2 -1), SolidBody 1(Fillet40)(phone mount - 2.2-1/moving lock 2.1 -1), SolidBody 1(Fillet9)(phone section 2.4 -1)
Curve Data:N/A			

Loads and Fixtures

Fixture name	Fixture Image	Fixture Details
Fixed-1		**Entities:** 1 face(s) **Type:** Fixed Geometry

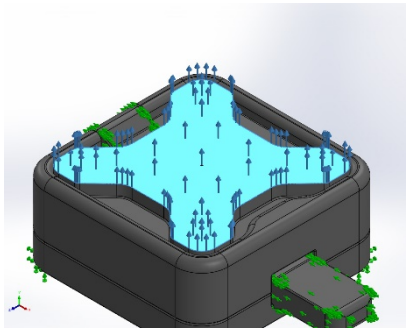
Resultant Forces

Components	X	Y	Z	Resultant
Reaction force(N)	-13.6231	-600	8.9407e-07	600.155
Reaction Moment(N.m)	0	0	0	0

Reference Geometry-1		**Entities:** 4 edge(s), 123 face(s) **Reference:** Edge< 1 > **Type:** Use reference geometry **Translation:** ---, ---, 0 **Units:** mm

Resultant Forces

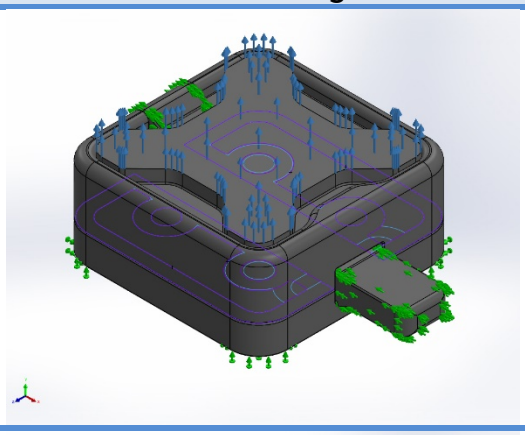
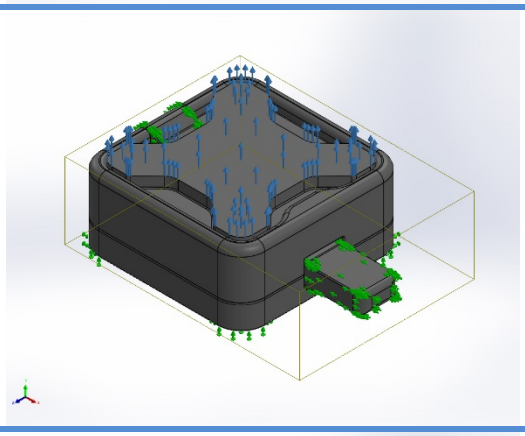
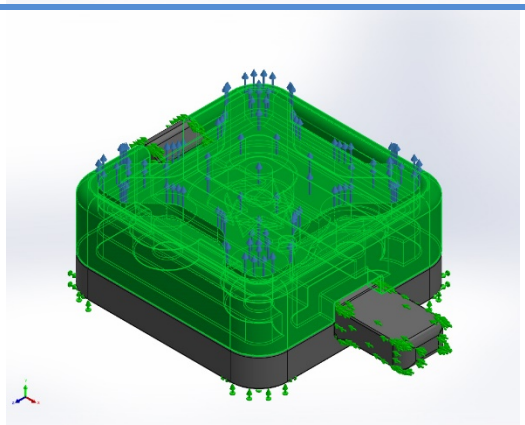
Components	X	Y	Z	Resultant
Reaction force(N)	13.6231	0	0	13.6231
Reaction Moment(N.m)	0	0	0	0

Load name	Load Image	Load Details
Force-1		**Entities:** 1 face(s) **Type:** Apply normal force **Value:** -600 N

Connector Definitions

No Data

Contact Information

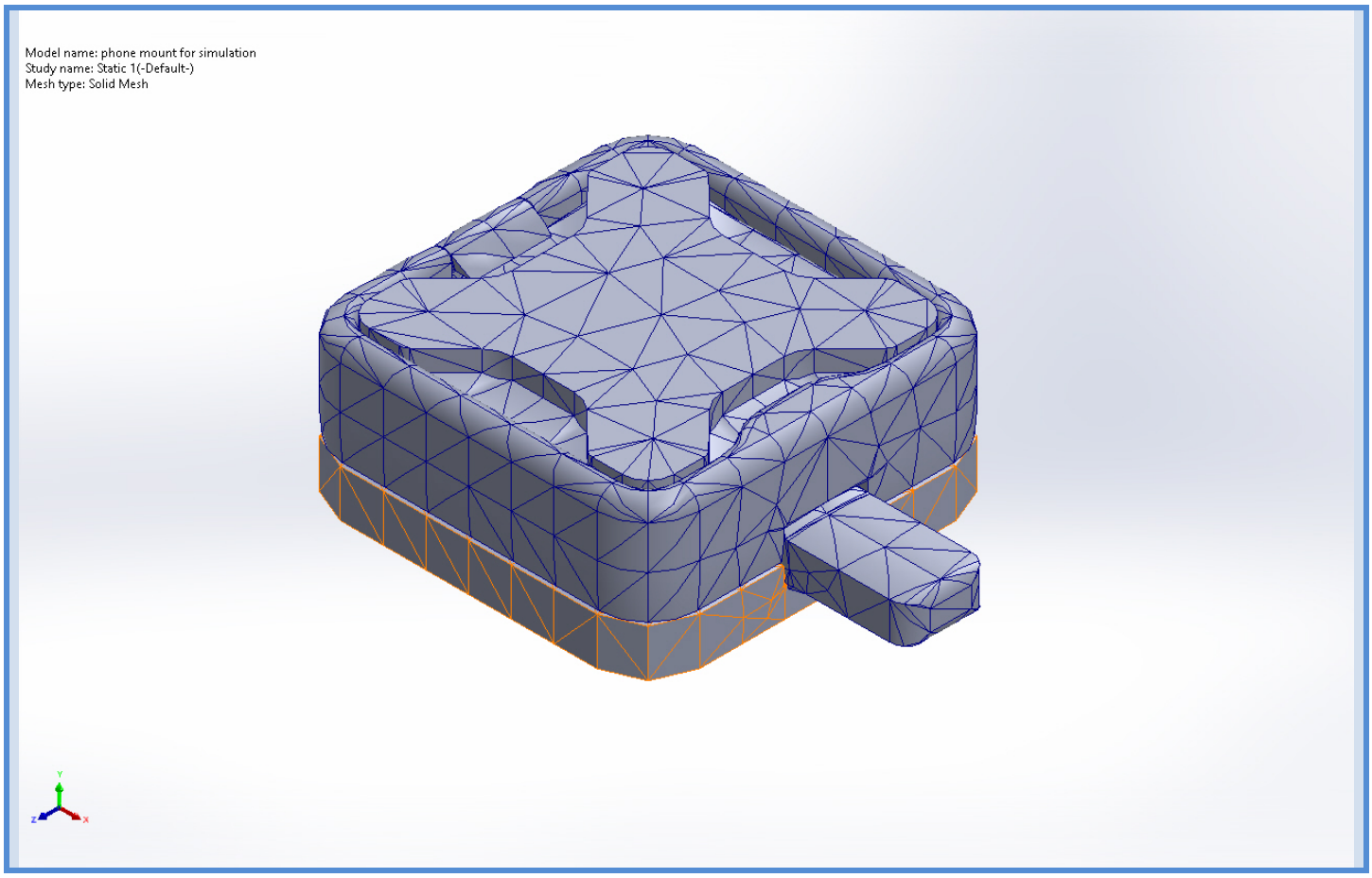
Contact	Contact Image	Contact Properties
Contact Set-1		**Type:** Bonded contact pair **Entities:** 4 face(s)
Global Contact		**Type:** Bonded **Components:** 1 component(s) **Options:** Incompatible mesh
Component Contact-1		**Type:** No penetration (Surface to surface) **Components:** 2 Solid Body (s)

Mesh information

Mesh type	Solid Mesh
Mesher Used:	Standard mesh
Automatic Transition:	Off
Include Mesh Auto Loops:	Off
Jacobian points for High quality mesh	16 Points
Element Size	4.89823 mm
Tolerance	0.244911 mm
Mesh Quality	High/Draft
Remesh failed parts with incompatible mesh	Off

Mesh information - Details

Total Nodes	9676
Total Elements	6304
Maximum Aspect Ratio	37.069
% of elements with Aspect Ratio < 3	57.8
% of elements with Aspect Ratio > 10	2.86
% of distorted elements(Jacobian)	24.6
Time to complete mesh(hh;mm;ss):	00:00:11
Computer name:	DESIGNENG



Sensor Details

No Data

Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	6.45957e-06	-600	-3.78163e-05	600

Reaction Moments

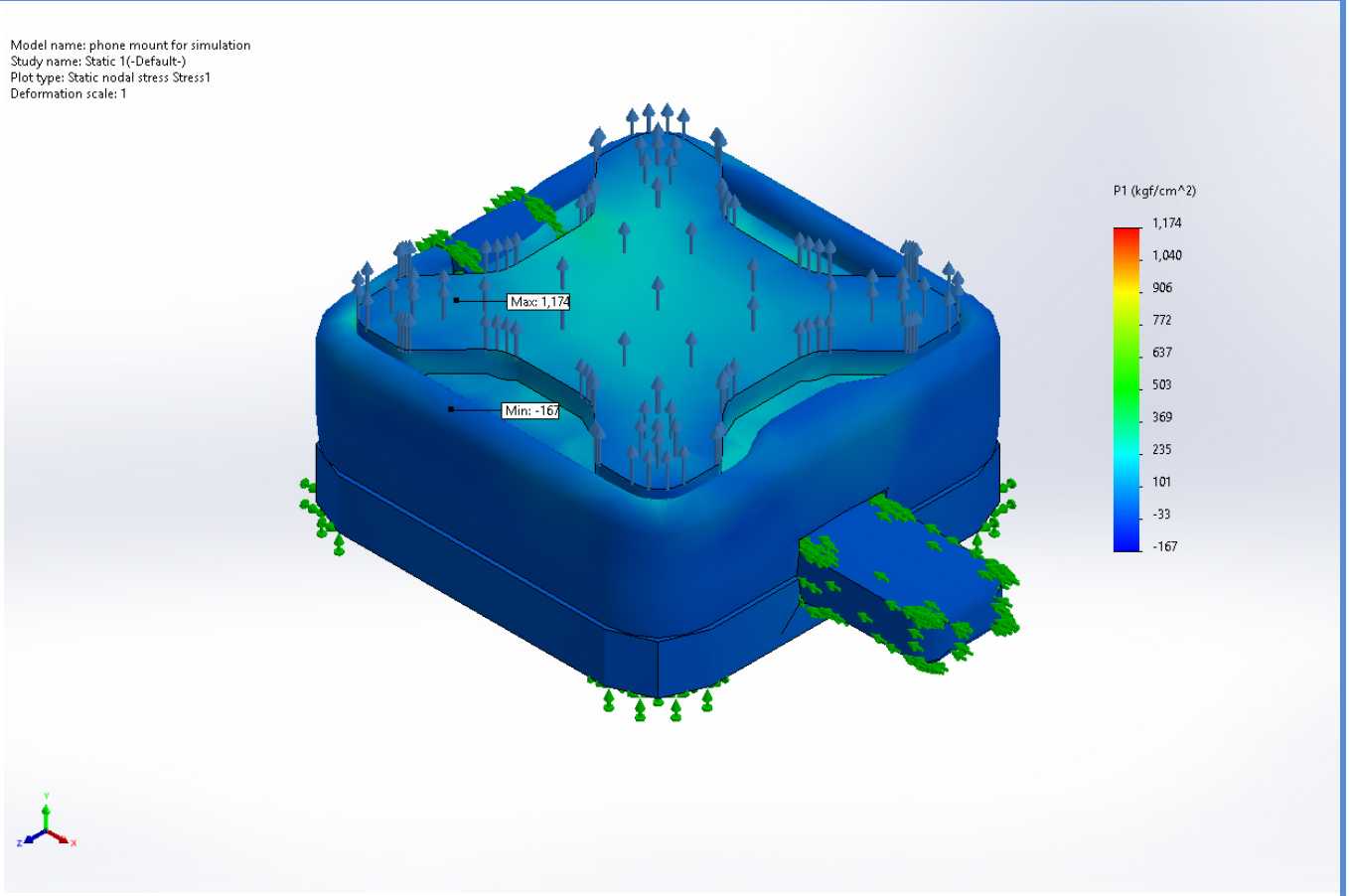
N/A					

Beams

No Data

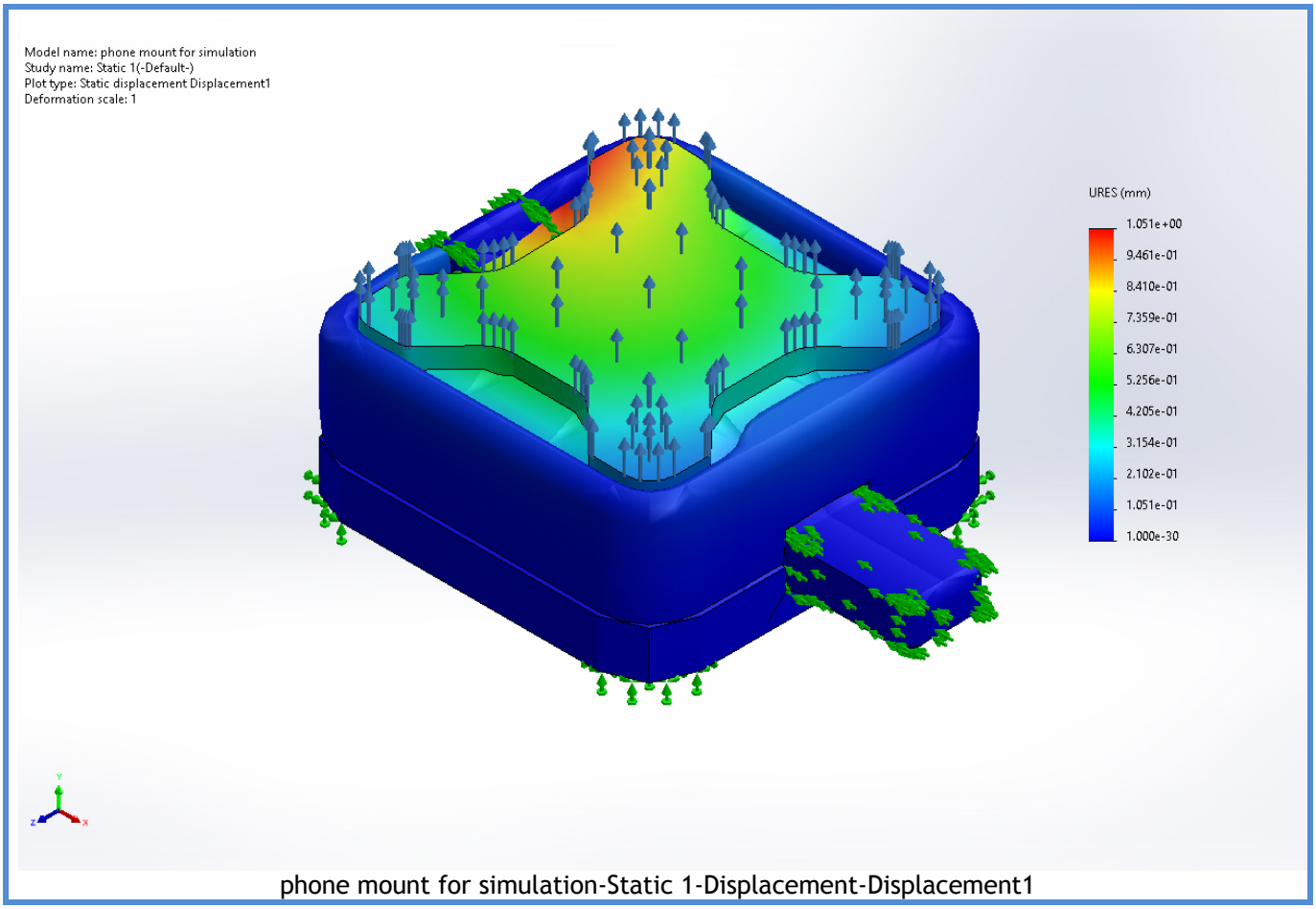
Study Results

Name	Type	Min	Max
Stress1	P1: 1st Principal Stress	-167kgf/cm^2 Node: 7267	1,174kgf/cm^2 Node: 4096



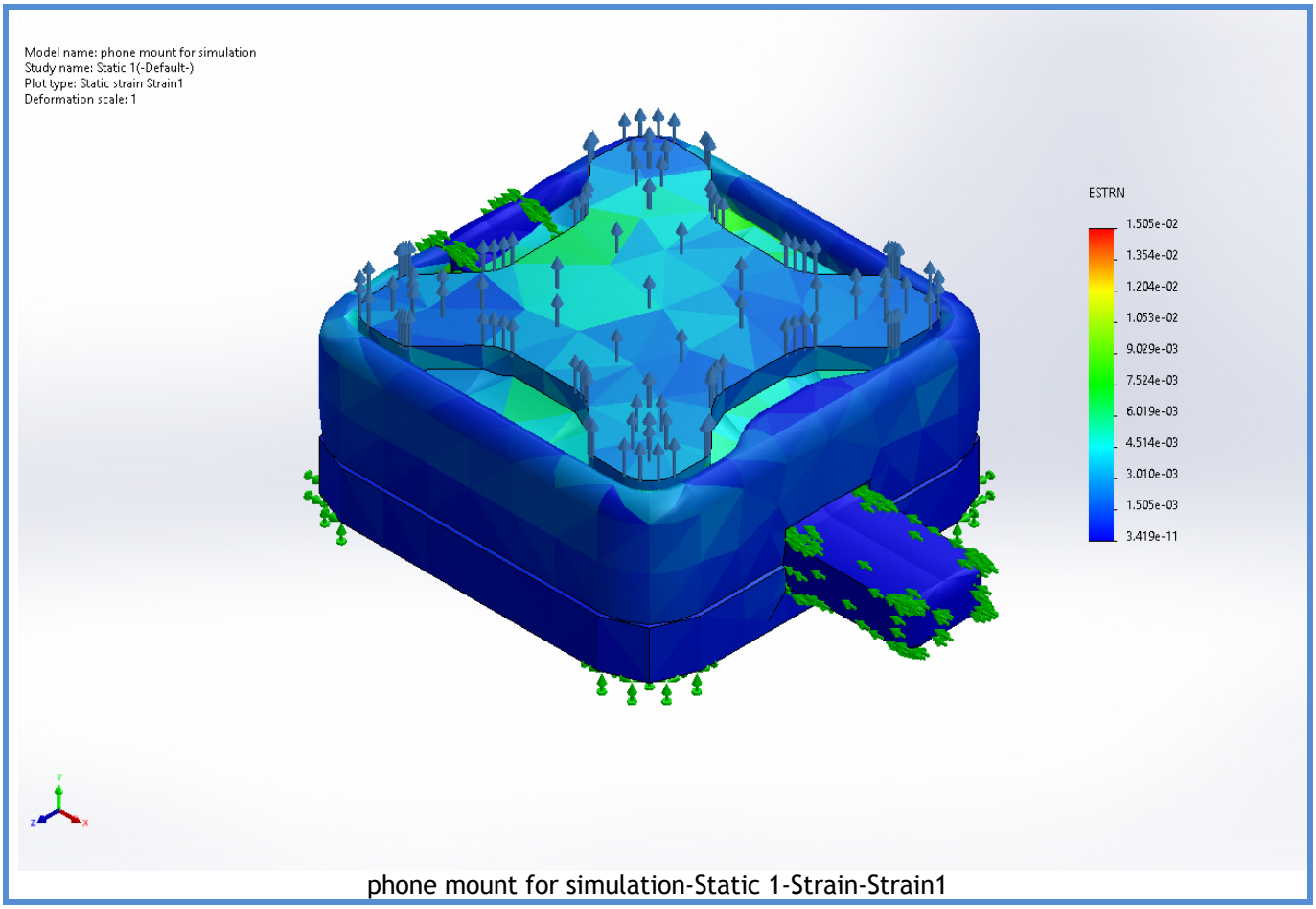
phone mount for simulation-Static 1-Stress-Stress1

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0.000e+00mm Node: 86	1.051e+00mm Node: 9511



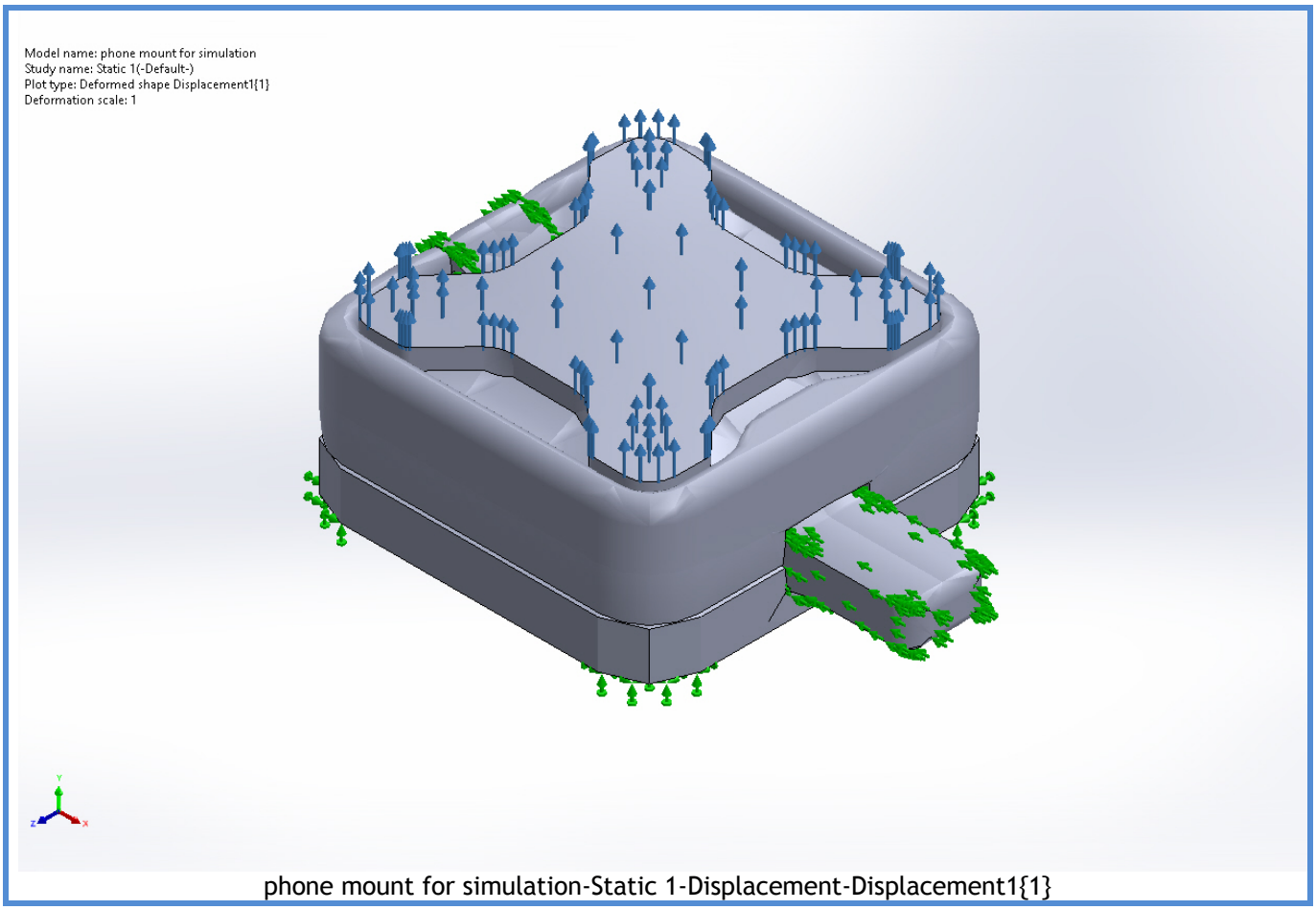
phone mount for simulation-Static 1-Displacement-Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	3.419e-11 Element: 4876	1.505e-02 Element: 6099



phone mount for simulation-Static 1-Strain-Strain1

Name	Type
Displacement1{1}	Deformed shape



phone mount for simulation-Static 1-Displacement-Displacement1{1}

Conclusion

Phone mount 2.1 is fit for purpose under normal tensile force.