Simulation of Assem1

Date: Tuesday, September 14, 2021
Designer: Solidworks
Study name: Drop Test 1
Analysis type: Drop Test

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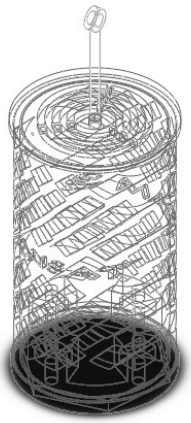
Description

No Data

Assumptions

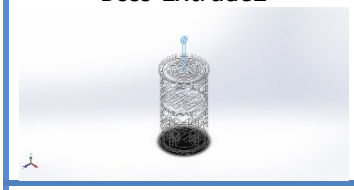
Model Information



Model name: Assem1
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
Cut-Extrude15	Solid Body	**Mass:0.036081 kg** **Volume:3.00675e-005 m^3** **Density:1200 kg/m^3** **Weight:0.353594 N**	**C:\Users\Habashy\Desktop\structure\base.SLDPRT** Sep 06 00:12:18 2021
Cut-Extrude3[3]	Solid Body	**Mass:7.93531e-006 kg** **Volume:6.61276e-009 m^3** **Density:1200 kg/m^3** **Weight:7.77661e-005 N**	**C:\Users\Habashy\Desktop\structure\body.SLDPRT** Sep 05 16:04:41 2021
Cut-Extrude3[2]	Solid Body	**Mass:8.83567e-006 kg** **Volume:7.36306e-009 m^3** **Density:1200 kg/m^3** **Weight:8.65896e-005 N**	**C:\Users\Habashy\Desktop\structure\body.SLDPRT** Sep 05 16:04:41 2021
Cut-Extrude6[2]	Solid Body	**Mass:1.25923e-005 kg** **Volume:1.04936e-008 m^3** **Density:1200 kg/m^3** **Weight:0.000123404 N**	**C:\Users\Habashy\Desktop\structure\body.SLDPRT** Sep 05 16:04:41 2021
Cut-Extrude6[1]	Solid Body	**Mass:0.0519059 kg** **Volume:4.32552e-005 m^3** **Density:1199.99 kg/m^3** **Weight:0.508678 N**	**C:\Users\Habashy\Desktop\structure\body.SLDPRT** Sep 05 16:04:41 2021

Boss-Extrude2 	Solid Body	**Mass:0.000974709 kg** **Volume:8.12257e-007 m^3** **Density:1200 kg/m^3** **Weight:0.00955215 N**	**C:\Users\Habashy\Desktop\structure\top rod.SLDPRT** Sep 05 08:43:04 2021
Cut-Extrude5	Solid Body	**Mass:0.0118671 kg** **Volume:9.88927e-006 m^3** **Density:1200 kg/m^3** **Weight:0.116298 N**	**C:\Users\Habashy\Desktop\structure\top.SLDPRT** Sep 05 17:20:29 2021

Study Properties

Study name	Drop Test 1
Analysis type	Drop Test
Mesh type	Solid Mesh
Large displacement	On
Result folder	SOLIDWORKS document (C:\Users\Habashy\Desktop\structure\simulation)

Setup Information

Type	Drop height
Drop Height from Centroid	10 m
Gravity	9.81 m/s^2
Gravity Reference	Top Plane
Friction Coefficient	0
Target Stiffness	Rigid target
Critical Damping Ratio	0

Result Options

Solution Time After Impact	126.5 microsec
Save Results Starting From	0 microsec
No. of Plots	25
No. of Graph Steps Per Plot	20
Number of vertex	0

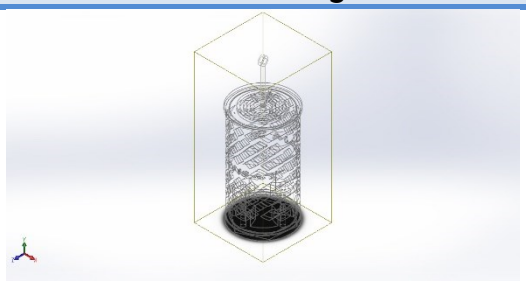
Units

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: Acrylic (Medium-high impact) **Model type:** Linear Elastic Isotropic **Default failure criterion:** Max von Mises Stress **Yield strength:** 4.5e+007 N/m^2 **Tensile strength:** 7.3e+007 N/m^2 **Elastic modulus:** 3e+009 N/m^2 **Poisson's ratio:** 0.35 **Mass density:** 1200 kg/m^3 **Shear modulus:** 8.9e+008 N/m^2 **Thermal expansion coefficient:** 5.2e-005 /Kelvin	SolidBody 1(Cut-Extrude15)(base-1), SolidBody 1(Cut-Extrude3[3])(body-1), SolidBody 2(Cut-Extrude3[2])(body-1), SolidBody 3(Cut-Extrude6[2])(body-1), SolidBody 4(Cut-Extrude6[1])(body-1), SolidBody 1(Boss-Extrude2)(top rod-2), SolidBody 1(Cut-Extrude5)(top-1)
Curve Data:N/A		

Contact Information

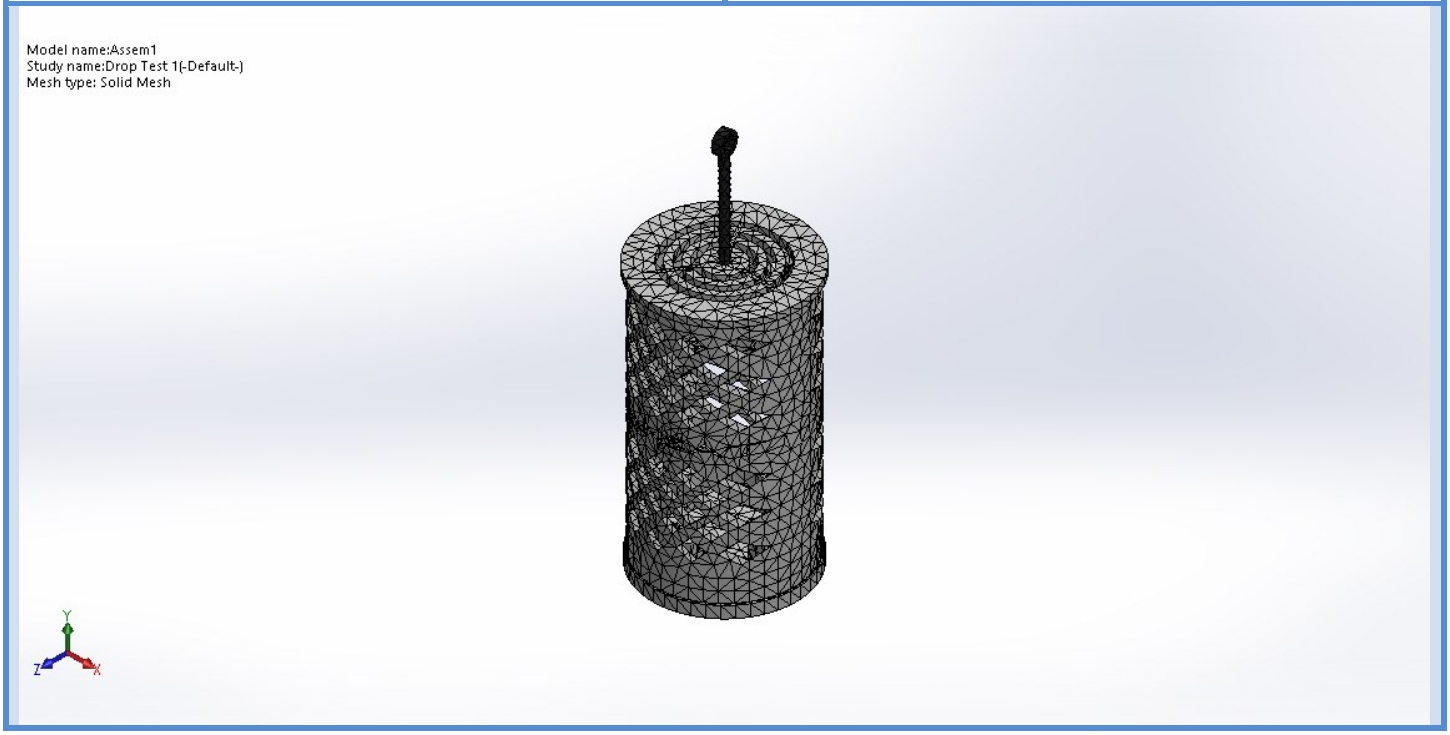
Contact	Contact Image	Contact Properties
Global Contact		**Type:** Bonded **Components:** 1 component(s) **Options:** Compatible mesh

Mesh information

Mesh type	Solid Mesh
Mesher Used:	Standard mesh
Automatic Transition:	Off
Include Mesh Auto Loops:	Off
Jacobian points	4 Points
Element Size	0.210173 in
Tolerance	0.0105087 in
Mesh Quality Plot	High
Remesh failed parts with incompatible mesh	Off

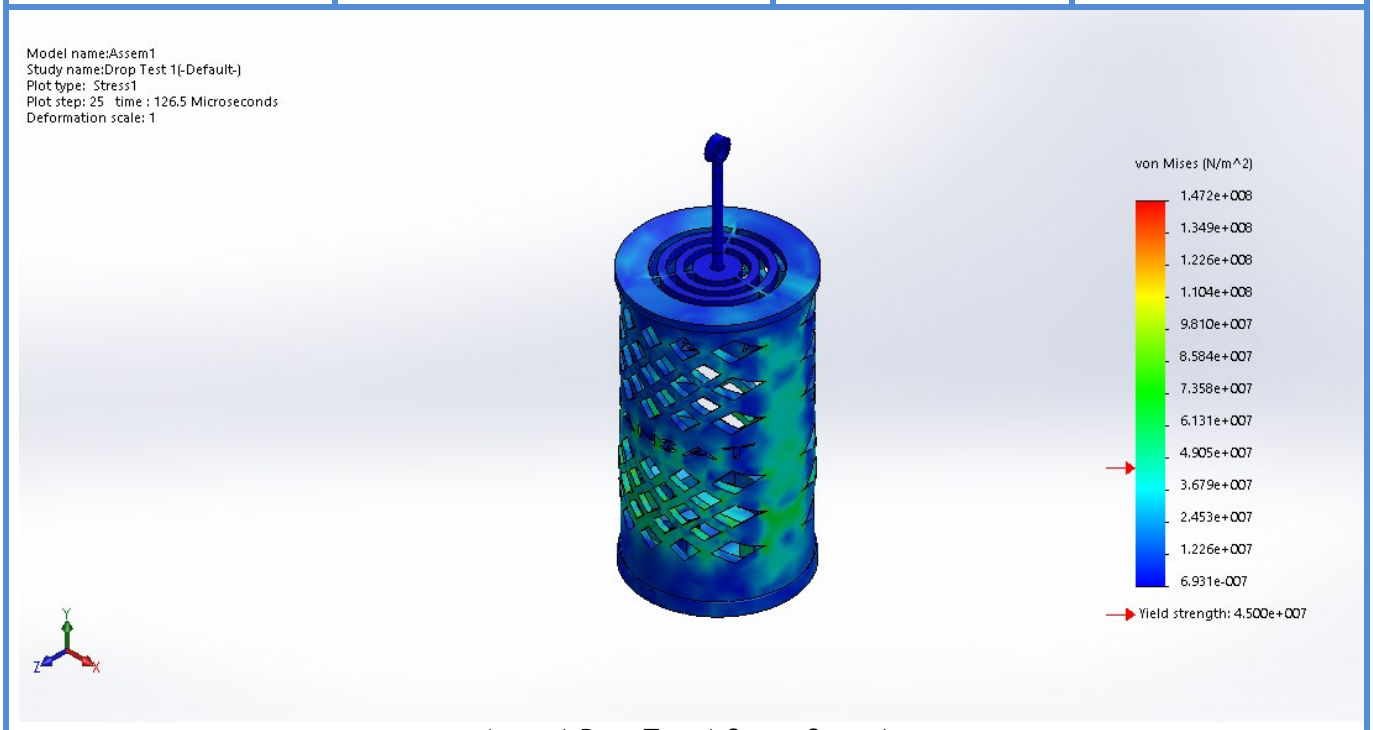
Mesh information - Details

Total Nodes	27480
Total Elements	31803
Maximum Aspect Ratio	79.66
% of elements with Aspect Ratio < 3	74.9
% of elements with Aspect Ratio > 10	3.39
% of distorted elements(Jacobian)	0
Time to complete mesh(hh;mm;ss):	00:00:17
Computer name:	



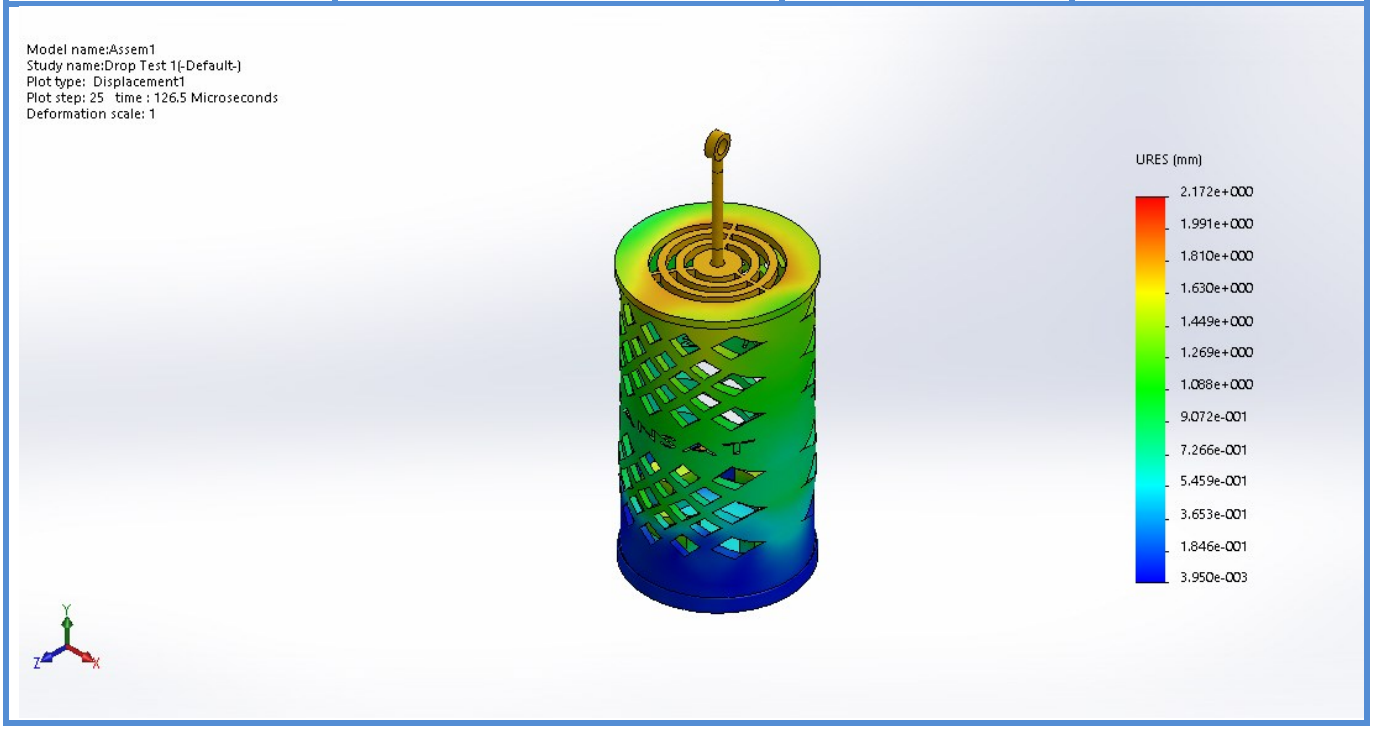
Study Results

Name	Type	Min	Max
Stress1	VON: von Mises Stress	6.931e-007N/m^2 Node: 23188	1.472e+008N/m^2 Node: 7941



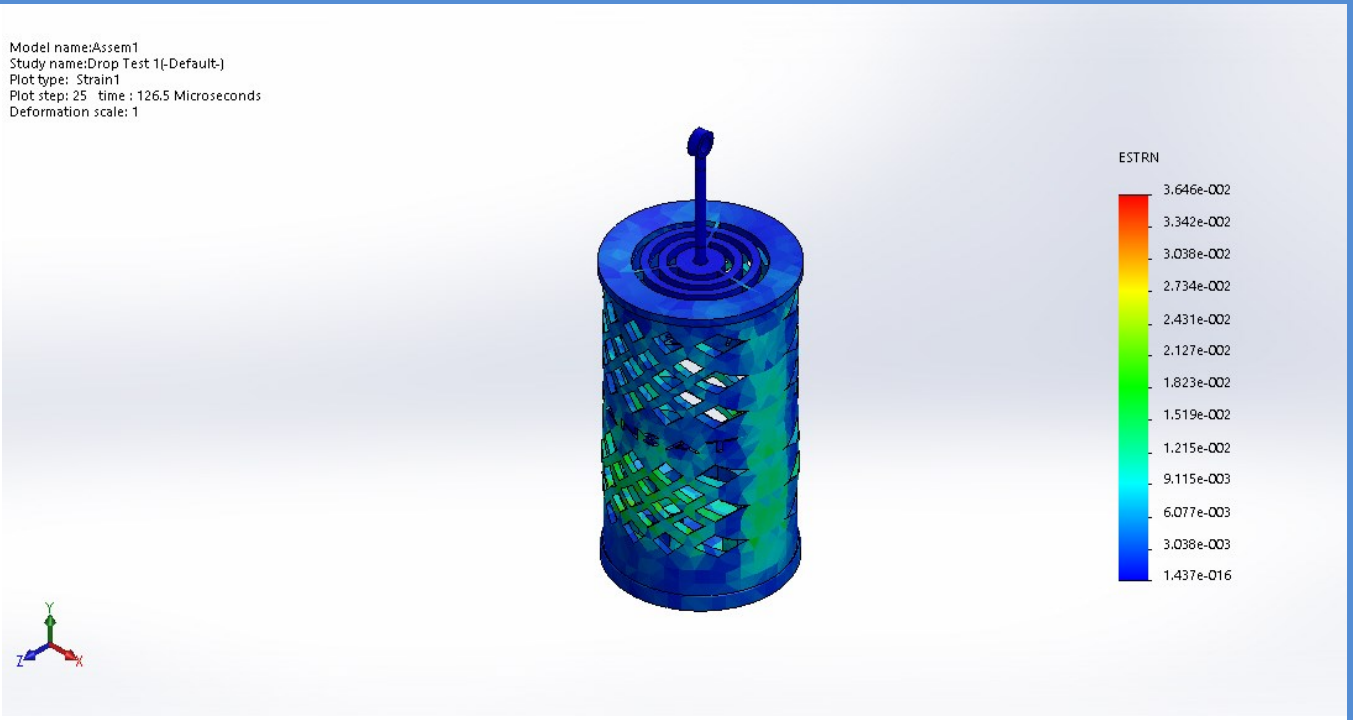
Assem1-Drop Test 1-Stress-Stress1

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	3.950e-003mm Node: 16298	2.172e+000mm Node: 7713



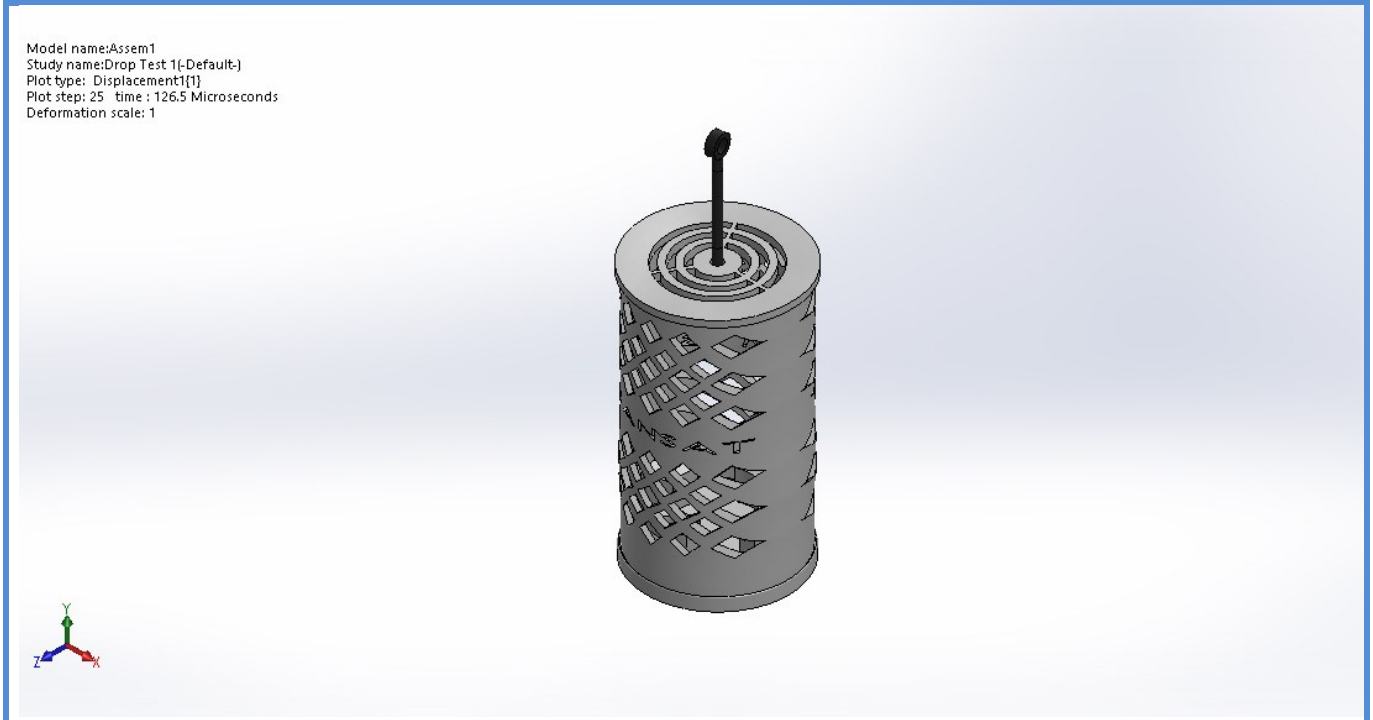
Assem1-Drop Test 1-Displacement-Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	1.437e-016 Element: 10594	3.646e-002 Element: 8865



Assem1-Drop Test 1-Strain-Strain1

Name	Type
Displacement1{1}	Deformed shape



Assem1-Drop Test 1-Displacement-Displacement1{1}

Conclusion