

Stress Analysis Report

Autodesk®

Analyzed File:	Round Foam.ipt
Autodesk Inventor Version:	2012 SP1 (Build 160190100, 190)
Creation Date:	Wednesday 27, 8:43 PM
Simulation Author:	Charles
Summary:	

Project Info (iProperties)

Summary

Author	Charles
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Project

Part Number	Round Foam
Designer	Charles
Cost	\$0.00
Date Created	Wednesday 27

Status

Design Status	WorkInProgress
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Physical

Material	PU Foam 60
Density	0.06 g/cm ³
Mass	634.523 kg
Area	147166000 mm ²
Volume	1.05754E+010 mm ³
Center of Gravity	x=0 mm y=0.000000480073 mm z=1585.56 mm

Note: Physical values could be different from Physical values used by FEA reported below.

Round Foam 60

General objective and settings:

Design Objective	Single Point
Simulation Type	Static Analysis
Last Modification Date	Wednesday 27, 8:43 PM
Detect and Eliminate Rigid Body Modes	No

Advanced settings:

Avg. Element Size (fraction of model diameter)	0.1
Min. Element Size (fraction of avg. size)	0.2
Grading Factor	1.5
Max. Turn Angle	60 deg
Create Curved Mesh Elements	Yes

Material(s)

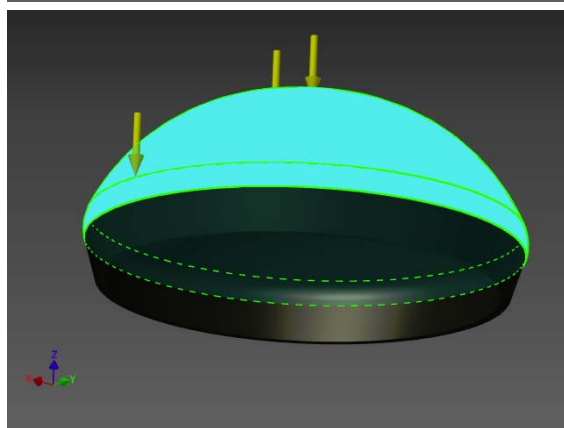
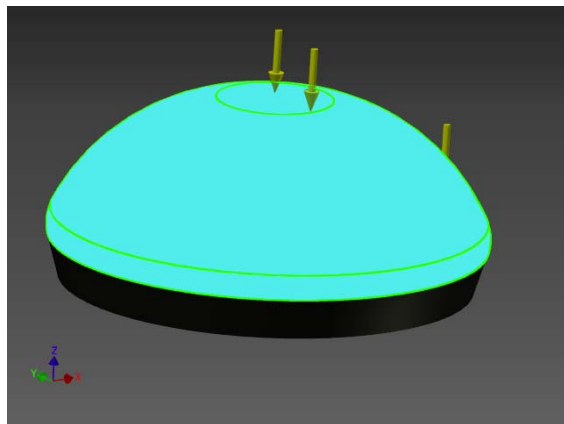
Name	PU Foam 60	
General	Mass Density	0.06 g/cm ³
	Yield Strength	30 MPa
	Ultimate Tensile Strength	5 MPa
Stress	Young's Modulus	0.382 GPa
	Poisson's Ratio	0.2 ul
	Shear Modulus	0.159167 GPa
Stress Thermal	Expansion Coefficient	0.00001 ul/c
	Thermal Conductivity	0.03 W/(m K)
	Specific Heat	1500 J/(kg c)
Part Name(s)	Round Foam.ipt	

Operating conditions

Force:1

Load Type	Force
Magnitude	222411.100 N
Vector X	-2751.622 N
Vector Y	1212.092 N
Vector Z	-222390.775 N

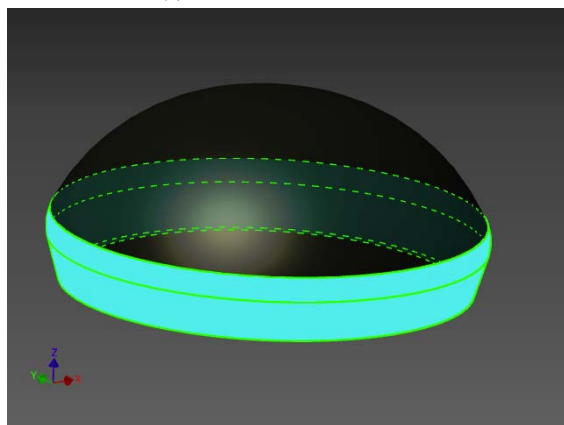
Selected Face(s)

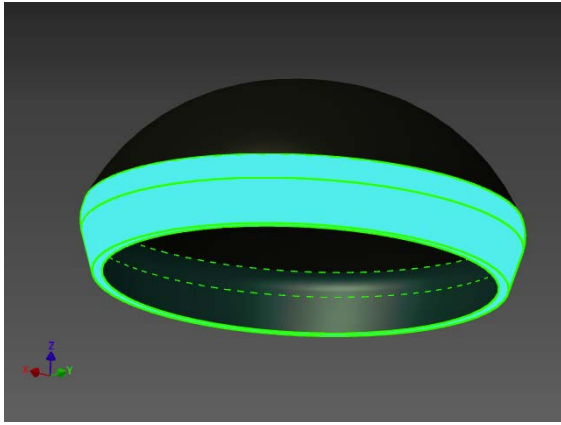


Fixed Constraint:1

Constraint Type Fixed Constraint

Selected Face(s)





▣ Results

▣ Reaction Force and Moment on Constraints

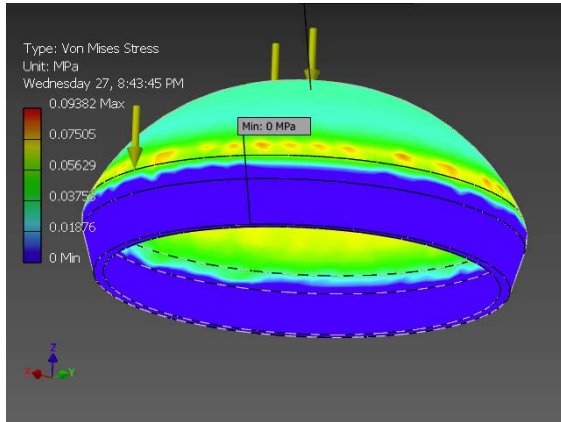
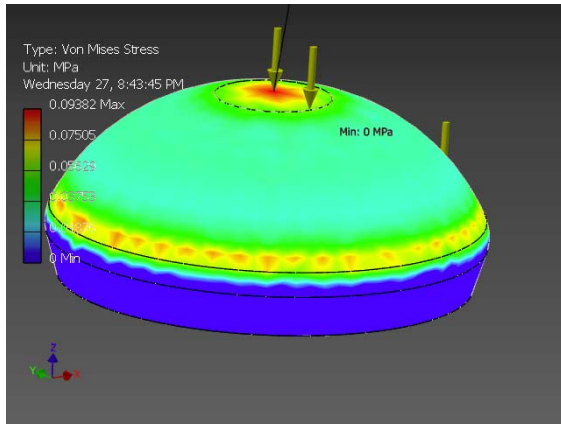
Constraint Name	Reaction Force		Reaction Moment	
	Magnitude	Component (X,Y,Z)	Magnitude	Component (X,Y,Z)
Fixed Constraint:1	222411 N	2751.62 N	4373.37 N m	1773.2 N m
		-1212.09 N		3997.77 N m
		222391 N		0 N m

▣ Result Summary

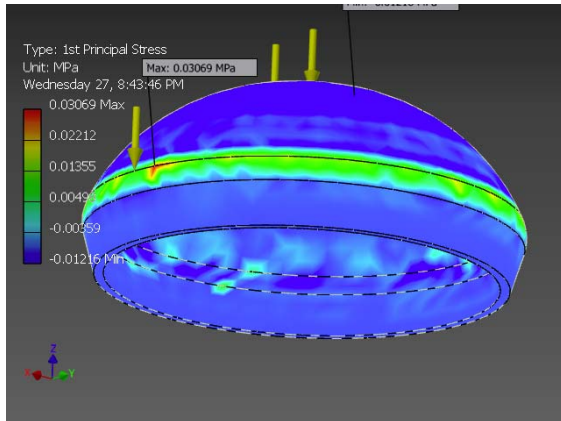
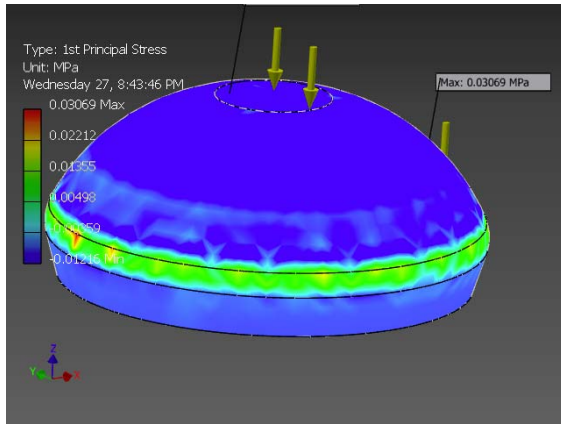
Name	Minimum	Maximum
Volume	1.05754E+010 mm^3	
Mass	634.523 kg	
Von Mises Stress	0.00000006621 MPa	0.093818 MPa
1st Principal Stress	-0.0121605 MPa	0.0306895 MPa
3rd Principal Stress	-0.0983407 MPa	0.000140703 MPa
Displacement	0 mm	1.47331 mm
Safety Factor	15 ul	15 ul
Stress XX	-0.0983382 MPa	0.00278528 MPa
Stress XY	-0.0150519 MPa	0.0157381 MPa
Stress XZ	-0.0447926 MPa	0.0424913 MPa
Stress YY	-0.0935441 MPa	0.00613102 MPa
Stress YZ	-0.0422008 MPa	0.0429617 MPa
Stress ZZ	-0.0703955 MPa	0.0129844 MPa
X Displacement	-0.141228 mm	0.111319 mm
Y Displacement	-0.124284 mm	0.137068 mm
Z Displacement	-1.47321 mm	0.000169374 mm
Equivalent Strain	0.00000000139069 ul	0.000243428 ul
1st Principal Strain	-0.000000216764 ul	0.000114037 ul
3rd Principal Strain	-0.000242574 ul	-0.00000000101862 ul
Strain XX	-0.000207294 ul	0.0000293254 ul
Strain XY	-0.0000472834 ul	0.0000494389 ul
Strain XZ	-0.00014071 ul	0.000133481 ul
Strain YY	-0.000192234 ul	0.0000318015 ul
Strain YZ	-0.000132568 ul	0.000134958 ul
Strain ZZ	-0.000164277 ul	0.0000946623 ul

▣ Figures

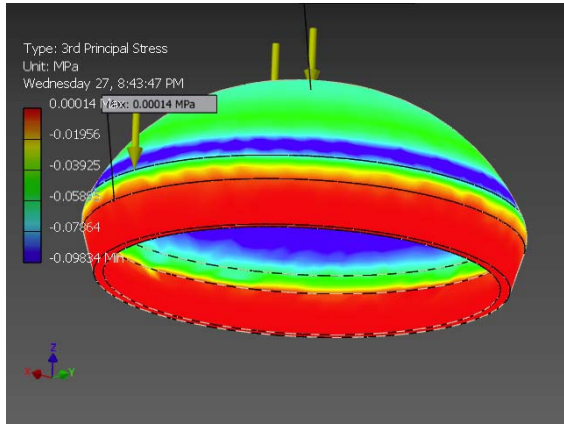
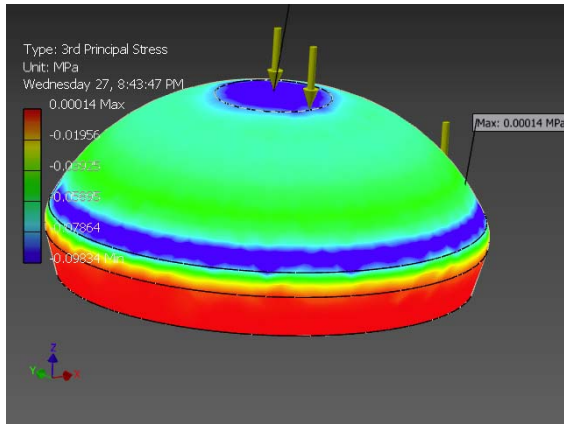
▣ Von Mises Stress



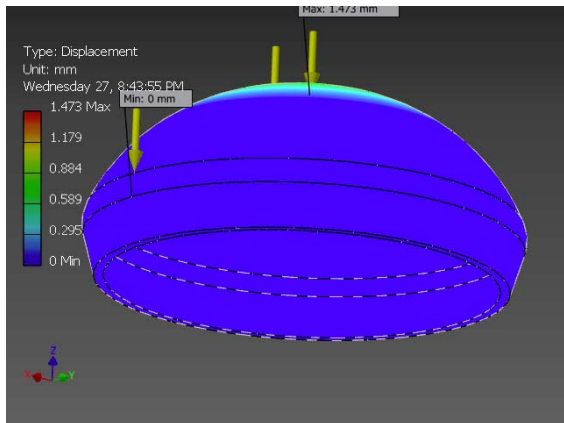
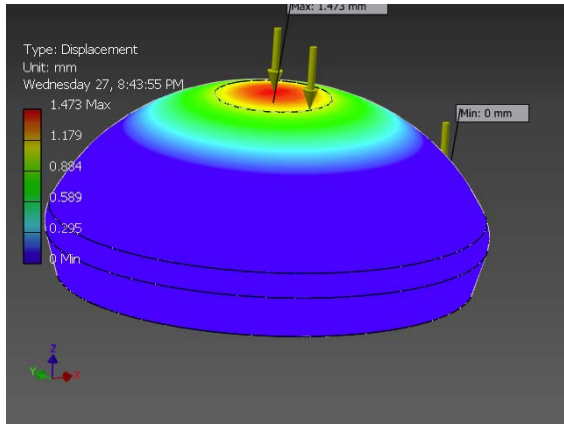
1st Principal Stress



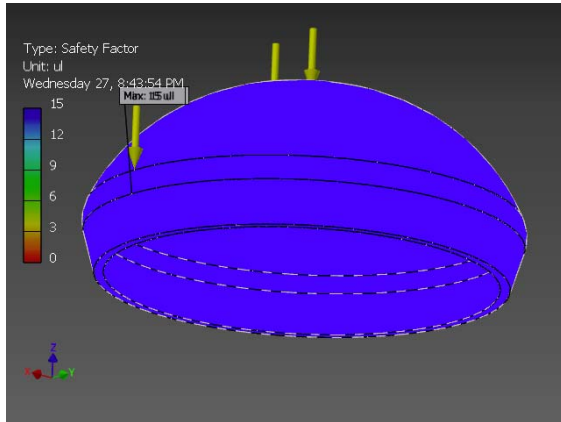
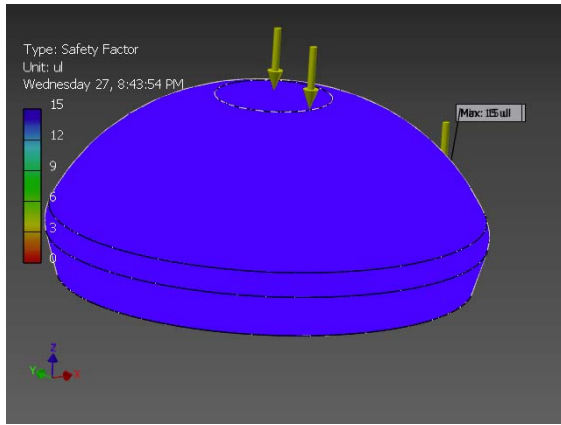
3rd Principal Stress



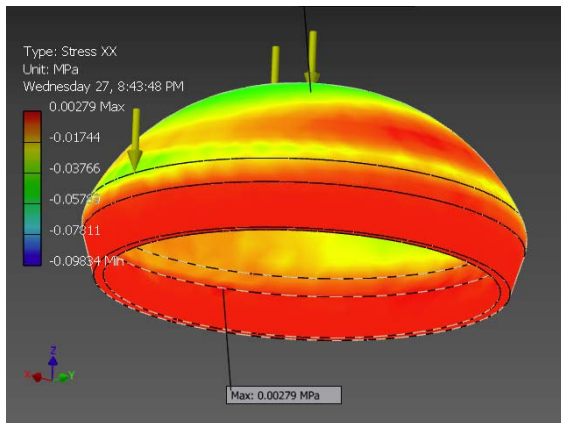
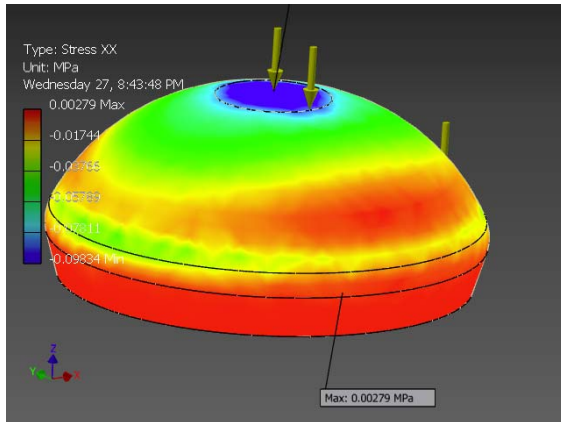
▣ Displacement



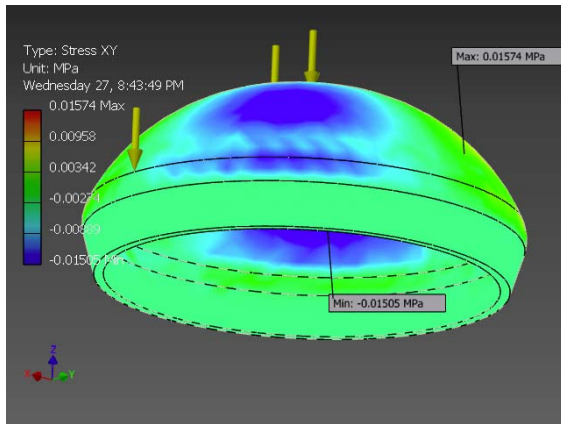
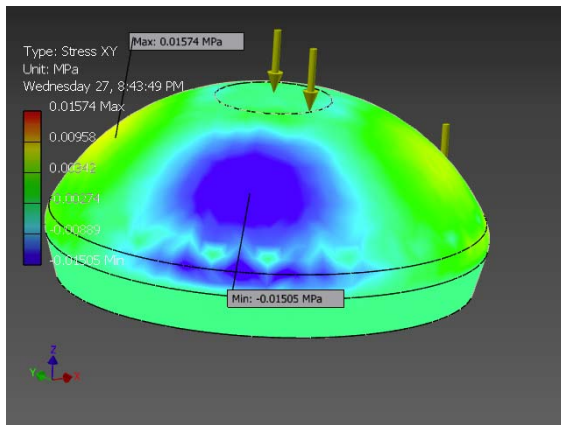
▣ Safety Factor



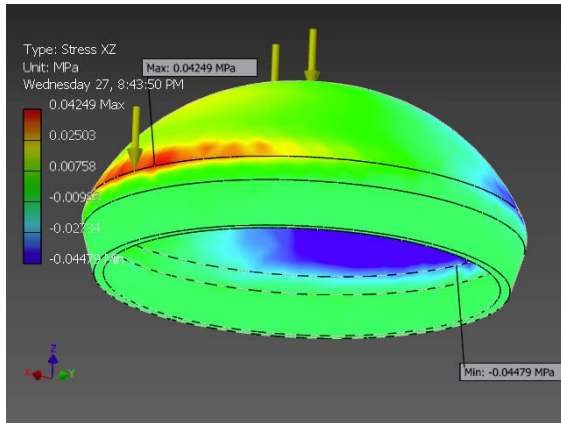
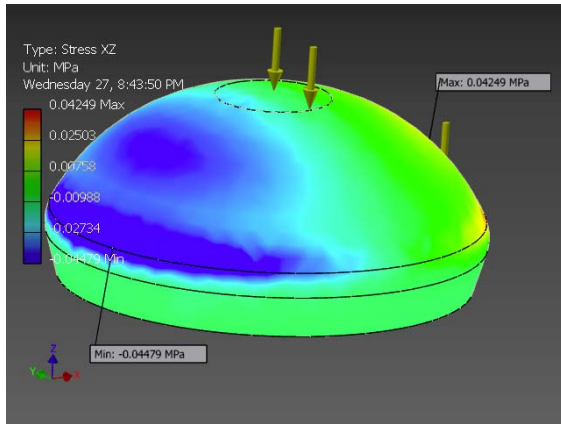
☐ Stress XX



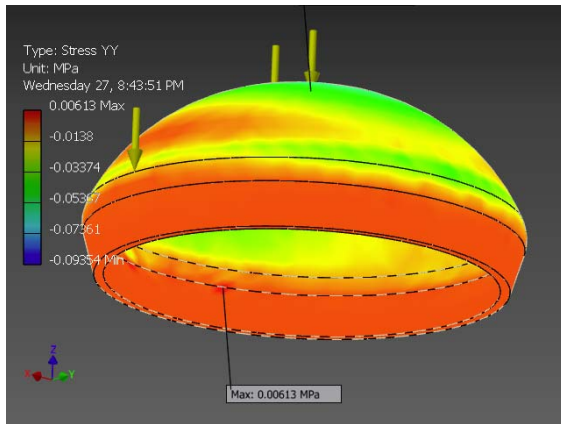
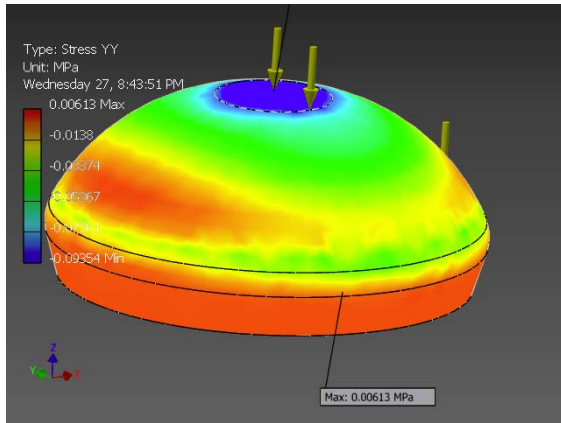
☐ Stress XY



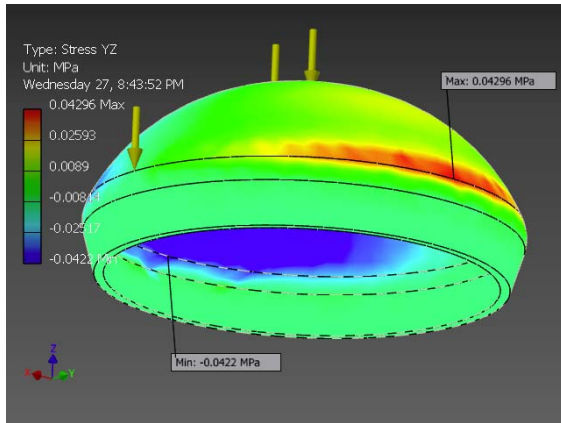
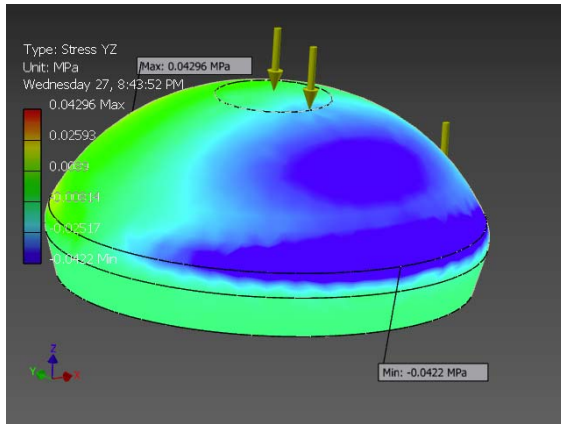
Stress XZ



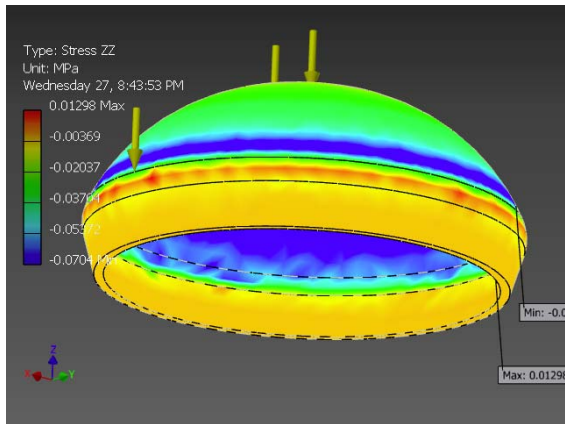
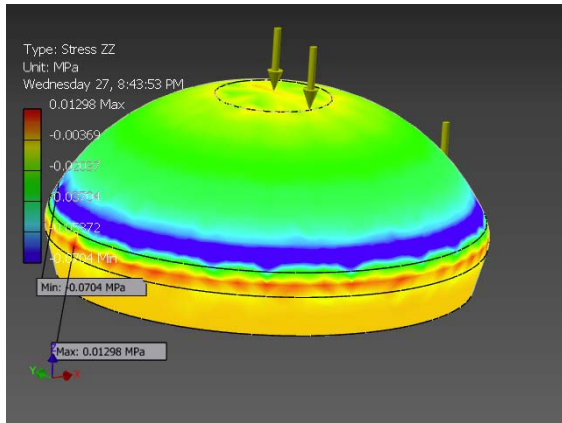
Stress YY



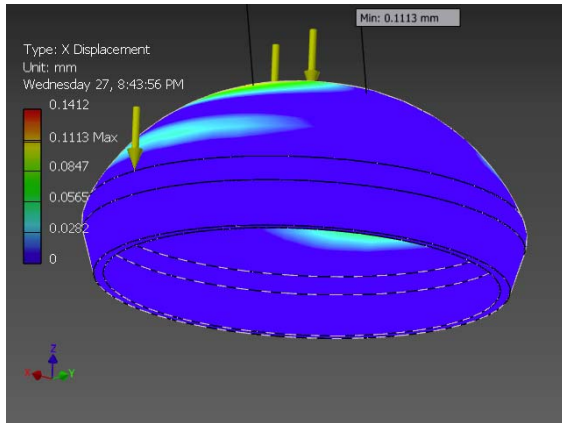
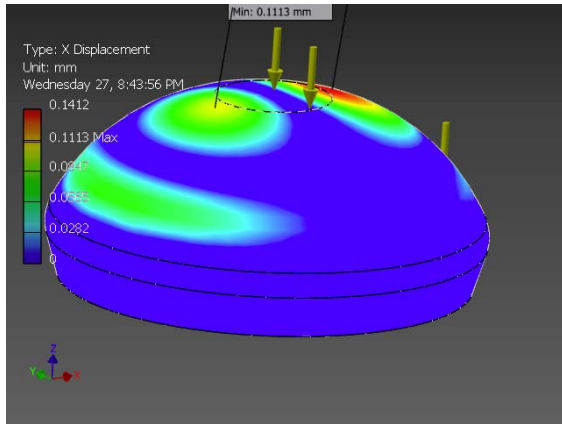
☐ Stress YZ



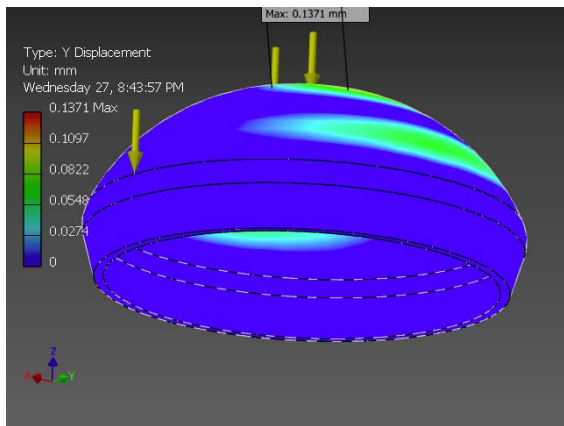
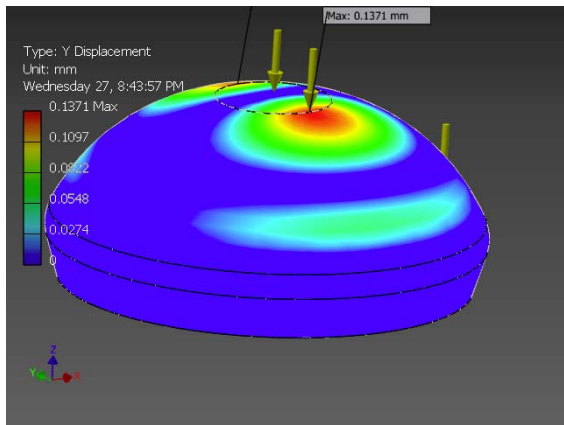
☐ Stress ZZ



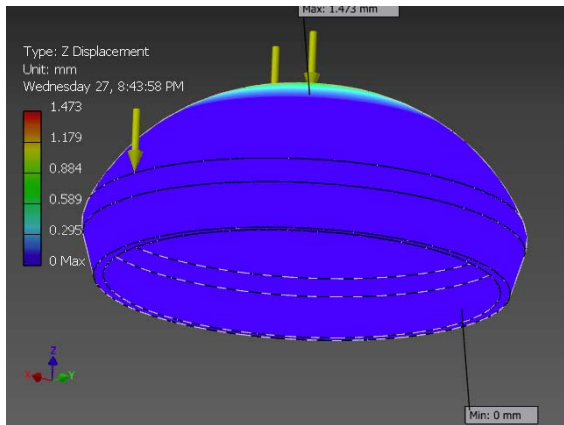
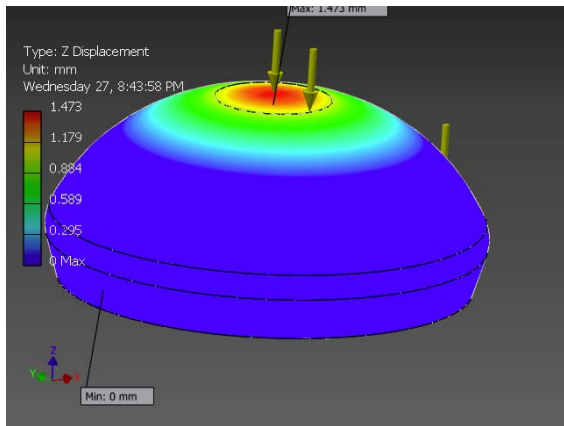
X Displacement



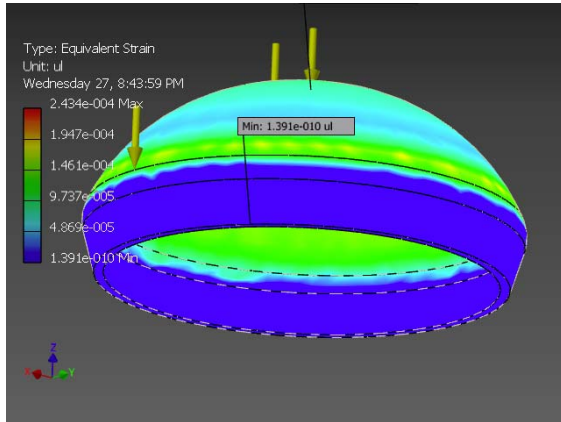
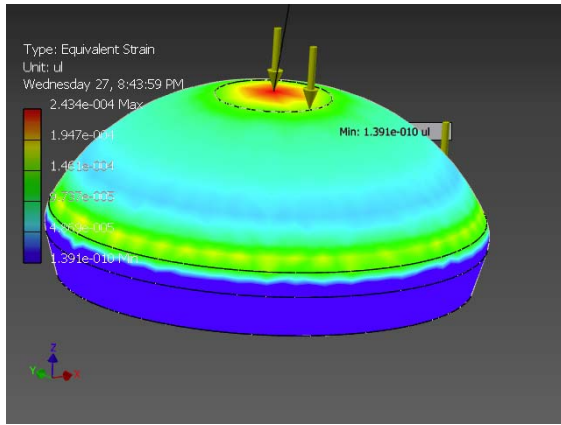
Y Displacement



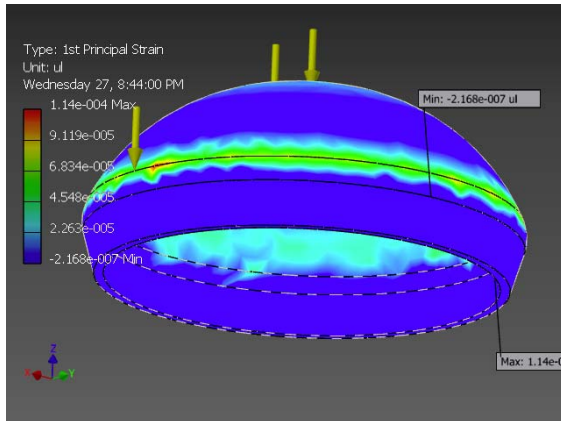
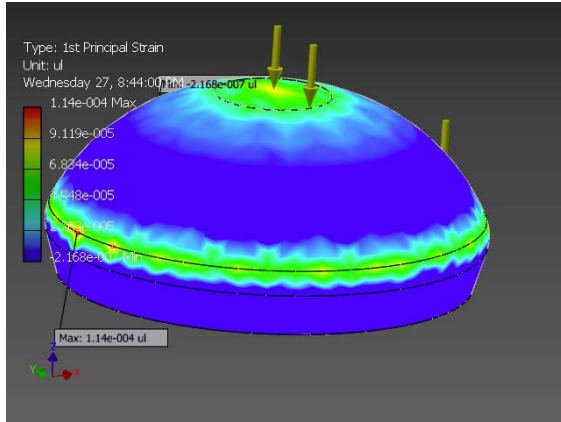
Z Displacement



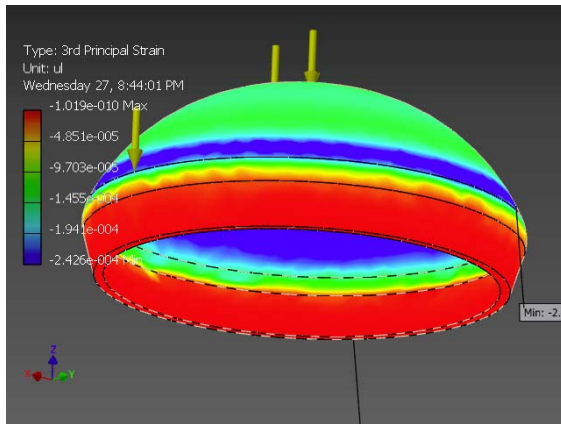
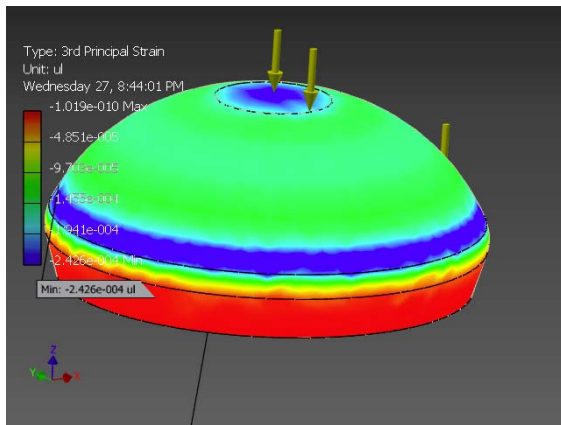
Equivalent Strain



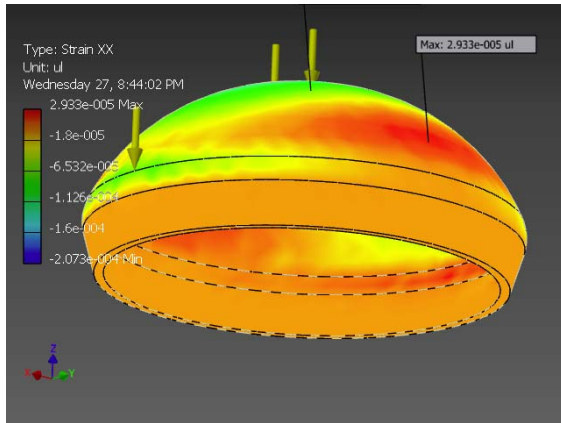
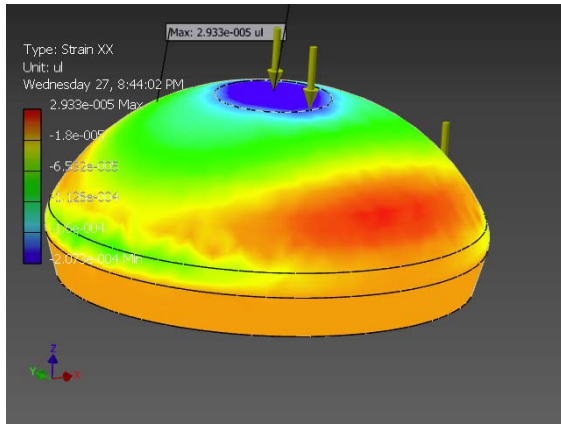
1st Principal Strain



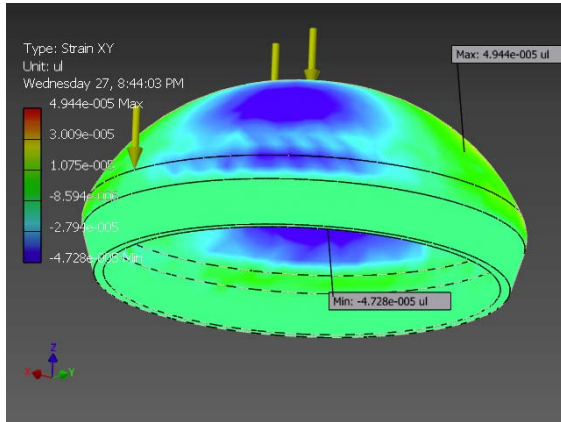
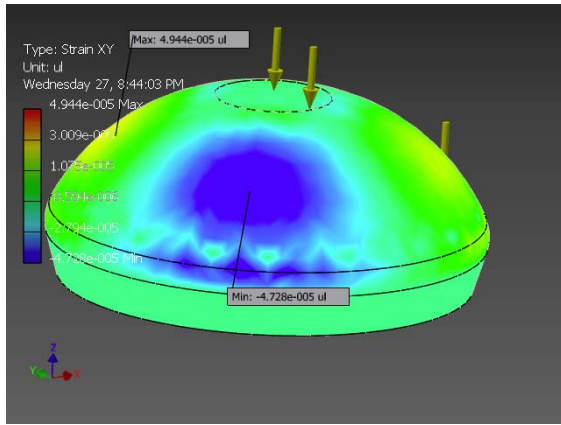
3rd Principal Strain



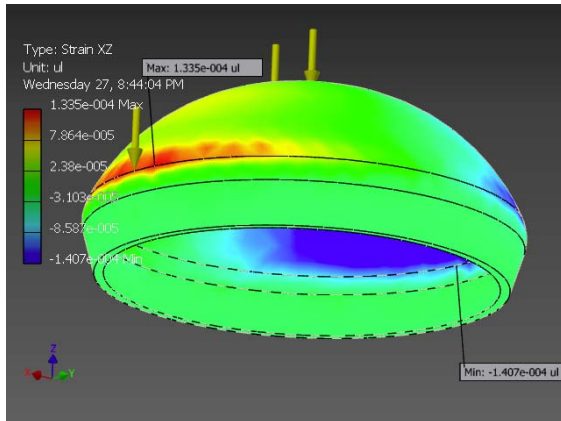
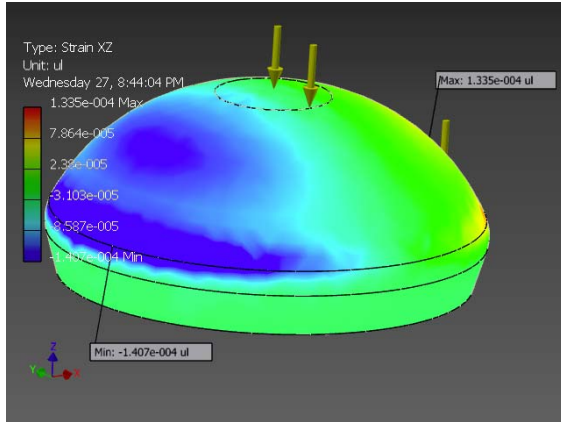
Strain XX



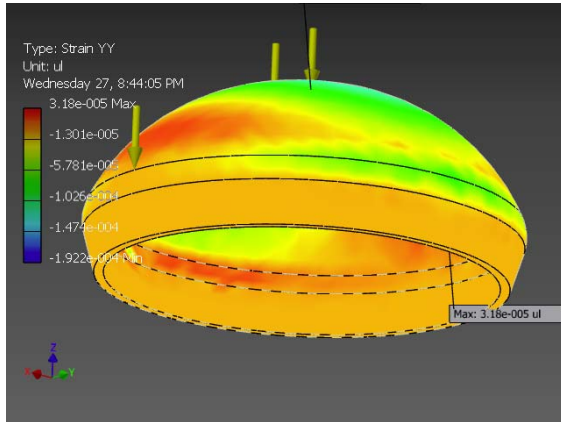
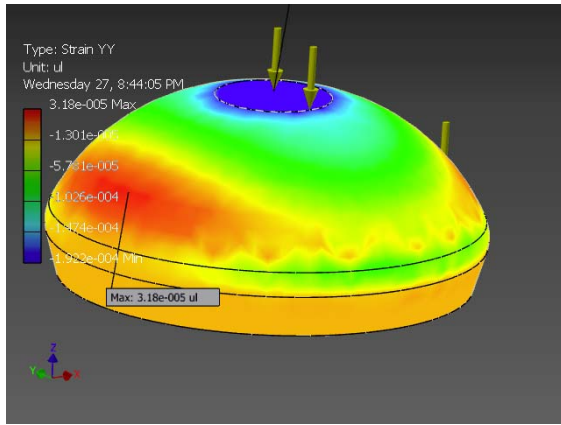
Strain XY



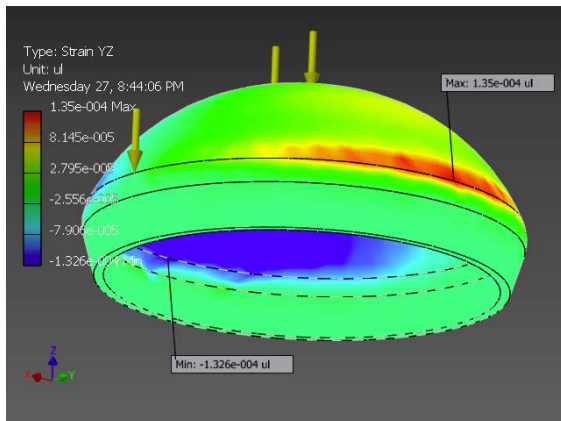
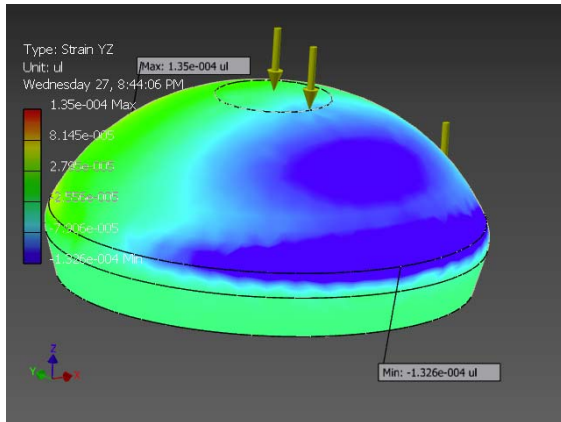
☐ Strain XZ



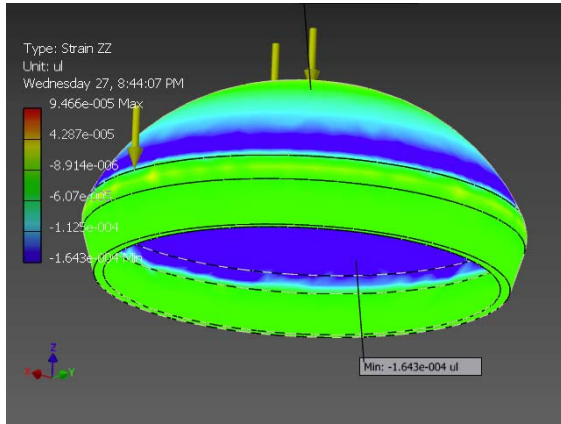
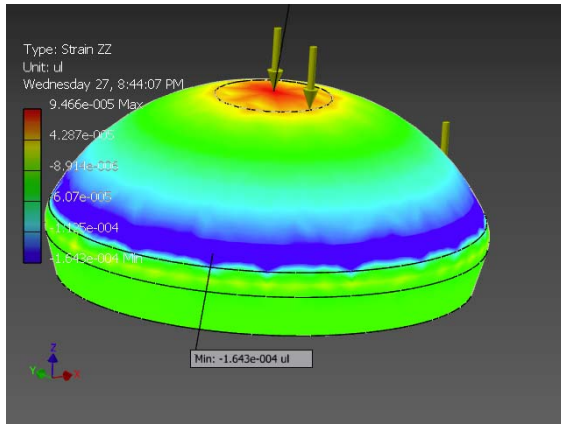
☐ Strain YY



Strain YZ



Strain ZZ



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