Analysis Sector Orientation 1.1 refined with carbon fiber slicing on hexcel sheet

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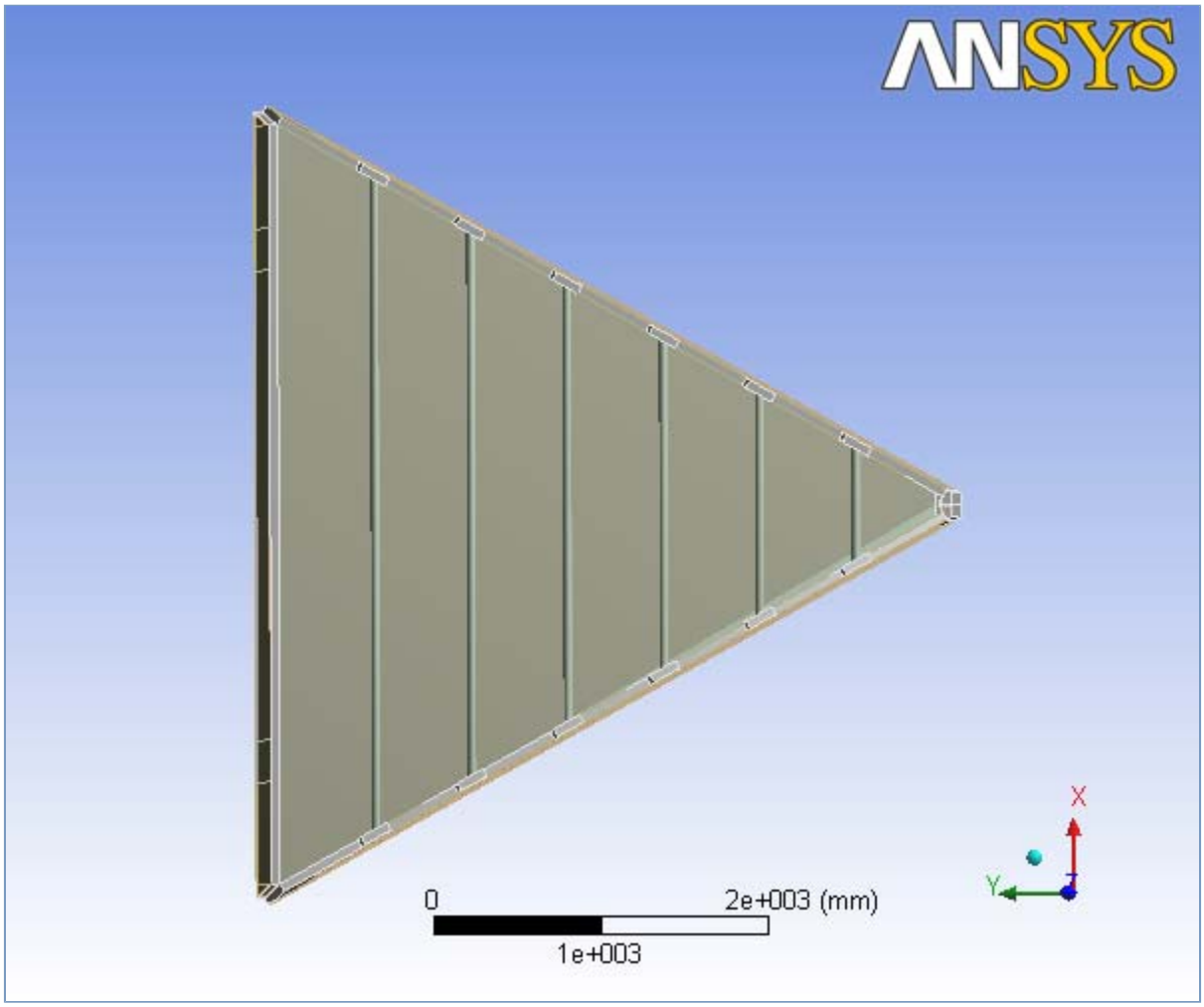


Contents

Units

TABLE 1

Unit System	Metric (mm, kg, N, °C, s, mV, mA)
Angle	Degrees
Rotational Velocity	rad/s

Orientation 1.1 refined

Geometry

TABLE 2
Orientation 1.1 refined > Geometry

Object Name	*Geometry*
State	Fully Defined
Definition	
Source	C:\Documents and Settings\Jinnuri\Desktop\website\Al slit\Mylar\R3_3.agdb
Type	DesignModeler
Length Unit	Millimeters
Element Control	Manual

Display Style	Material
Bounding Box	
Length X	4768.3 mm
Length Y	4080. mm
Length Z	2004. mm
Properties	
Volume	7.9584e+008 mm³
Mass	333.27 kg
Statistics	
Bodies	32
Active Bodies	31
Nodes	154686
Elements	23855
Preferences	
Import Solid Bodies	Yes
Import Surface Bodies	Yes
Import Line Bodies	Yes
Parameter Processing	Yes
Personal Parameter Key	DS
CAD Attribute Transfer	No
Named Selection Processing	No
Material Properties Transfer	No
CAD Associativity	Yes
Import Coordinate Systems	No
Reader Save Part File	No
Import Using Instances	Yes
Do Smart Update	No
Attach File Via Temp File	No
Analysis Type	3-D
Mixed Import Resolution	None
Enclosure and Symmetry Processing	Yes

TABLE 3
Orientation 1.1 refined > Geometry > Parts

Object Name	*Rod 4*	*Rod 5*	*Rod 6*	*Rod 1*	*Rod 2*
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Carbon Fiber				
Stiffness Behavior	Flexible				
Brick Integration Scheme	Full				
Nonlinear Material Effects	Yes				
Bounding Box					
Length X	2618.1 mm	3260.4 mm	3902.6 mm	691.28 mm	1333.5 mm
Length Y	50.8 mm				

Length Z	50.8 mm				
Properties					
Volume	5.1151e+005 mm³	6.3841e+005 mm³	7.6532e+005 mm³	1.3079e+005 mm³	2.577e+005 mm³
Mass	0.29667 kg	0.37028 kg	0.44388 kg	7.586e-002 kg	0.14946 kg
Centroid X	-3.0688e-010 mm	-8.6731e-011 mm	-1.3795e-008 mm	-7.386e-011 mm	5.0812e-010 mm
Centroid Y	2220.1 mm	2776.3 mm	3332.5 mm	551.82 mm	1107.8 mm
Centroid Z	880.31 mm	1091.6 mm	1302.9 mm	246.45 mm	457.74 mm
Moment of Inertia Ip1	177.84 kg·mm²	221.97 kg·mm²	266.09 kg·mm²	45.457 kg·mm²	89.595 kg·mm²
Moment of Inertia Ip2	1.6387e+005 kg·mm²	3.1853e+005 kg·mm²	5.4867e+005 kg·mm²	2768.1 kg·mm²	21001 kg·mm²
Moment of Inertia Ip3	1.6388e+005 kg·mm²	3.1853e+005 kg·mm²	5.4867e+005 kg·mm²	2768.2 kg·mm²	21001 kg·mm²
Statistics					
Nodes	21042	26334	31528	5264	10556
Elements	2996	3752	4494	742	1498

TABLE 4
Orientation 1.1 refined > Geometry > Parts

Object Name	*Rod 3*	*Mylar*
State	Meshed	Suppressed
Graphics Properties		
Visible	Yes	No
Transparency	1	
Definition		
Suppressed	No	Yes
Material	Carbon Fiber	Stainless Steel
Stiffness Behavior	Flexible	
Brick Integration Scheme	Full	
Nonlinear Material Effects	Yes	
Thickness		2.54e-002 mm
Thickness Mode		Manual
Bounding Box		
Length X	1975.8 mm	4522. mm
Length Y	50.8 mm	3806.6 mm
Length Z	50.8 mm	1446. mm
Properties		
Volume	3.846e+005 mm³	2.404e+005 mm³
Mass	0.22307 kg	1.9232 kg
Centroid X	-5.8382e-011 mm	
Centroid Y	1663.9 mm	
Centroid Z	669.03 mm	
Moment of Inertia Ip1	133.72 kg·mm²	
Moment of Inertia Ip2	69702 kg·mm²	
Moment of Inertia Ip3	69702 kg·mm²	
Surface Area(approx.)		9.4645e+006 mm²
Statistics		
Nodes	15848	0
Elements	2254	0

TABLE 5
Orientation 1.1 refined > Geometry > Body Groups

Object Name	*Nose Plate*	*Left Endplate Polyurethane*	*Right Endplate Polyurthane*
State	Meshed		
Graphics Properties			
Visible	Yes		
Definition			
Suppressed	No		
Material	Aluminum	Polyurethane	
Bounding Box			
Length X	180.6 mm	2327.6 mm	2322.8 mm
Length Y	94.006 mm	3980.8 mm	3972.4 mm
Length Z	534.95 mm	1956.7 mm	1954.5 mm
Properties			
Volume	6.6337e+006 mm³	1.1613e+008 mm³	1.1588e+008 mm³
Mass	17.911 kg	27.87 kg	27.811 kg
Statistics			
Nodes	735	17477	16318
Elements	328	3040	2822

TABLE 6
Orientation 1.1 refined > Geometry > Nose Plate > Parts

Object Name	*30 deg Ref line*	*Nose Plate*	*Force ref line*	*60 Deg Ref line*
State	Fully Defined			
Graphics Properties				
Visible	Yes			
Transparency	1			
Definition				
Suppressed	No			
Material	Aluminum			
Brick Integration Scheme	Full			
Nonlinear Material Effects	Yes			
Bounding Box				
Length X	11.116 mm	180.6 mm	70. mm	20.123 mm
Length Y	19.253 mm	94.006 mm	3.6786 mm	11.618 mm
Length Z	5. mm	529.95 mm	5. mm	
Properties				
Volume	535.05 mm³	6.6319e+006 mm³	643.76 mm³	584.49 mm³
Mass	1.4446e-003 kg	17.906 kg	1.7382e-003 kg	1.5781e-003 kg
Centroid X	N/A			
Centroid Y	N/A			
Centroid Z	N/A			
Moment of Inertia Ip1	N/A			
Moment of Inertia Ip2	N/A			
Moment of Inertia Ip3	N/A			
Statistics				
Nodes	22	652	99	22
Elements	2	311	13	2

TABLE 7
Orientation 1.1 refined > Geometry > Left Endplate Polyurethane > Parts

Object Name	*Left Endplate Downstream Hole area*	*Left Endplate Upstream Hole area*	*Left Endplate Polyurethane*
State	Fully Defined		
Graphics Properties			
Visible	Yes		
Transparency	1		
Definition			
Suppressed	No		
Material	Polyurethane		
Brick Integration Scheme	Full		
Nonlinear Material Effects	Yes		
Bounding Box			
Length X	2159.8 mm	1973.8 mm	2327.6 mm
Length Y	3690. mm	3368. mm	3980.8 mm
Length Z	1562.8 mm	1437.5 mm	1956.7 mm
Properties			
Volume	4.3107e+007 mm³	3.8462e+007 mm³	3.4557e+007 mm³
Mass	10.346 kg	9.2309 kg	8.2936 kg
Centroid X	N/A		
Centroid Y	N/A		
Centroid Z	N/A		
Moment of Inertia Ip1	N/A		
Moment of Inertia Ip2	N/A		
Moment of Inertia Ip3	N/A		
Statistics			
Nodes	4717	8933	7347
Elements	720	1440	880

TABLE 8
Orientation 1.1 refined > Geometry > Right Endplate Polyurthane > Parts

Object Name	*Right Endplate Upstream Hole area*	*Right Endplate Polyurethane*	*Right Endplate Downstream Hole area*
State	Fully Defined		
Graphics Properties			
Visible	Yes		
Transparency	1		
Definition			
Suppressed	No		
Material	Polyurethane		
Brick Integration Scheme	Full		
Nonlinear Material Effects	Yes		
Bounding Box			
Length X	2116.2 mm	2322.8 mm	1998.1 mm
Length Y	3614.6 mm	3972.4 mm	3410. mm
Length Z	1531.7 mm	1954.5 mm	1457.6 mm
Properties			
Volume	4.1332e+007 mm³	3.4764e+007 mm³	3.9784e+007 mm³
Mass	9.9198 kg	8.3434 kg	9.5482 kg

Centroid X	N/A		
Centroid Y	N/A		
Centroid Z	N/A		
Moment of Inertia Ip1	N/A		
Moment of Inertia Ip2	N/A		
Moment of Inertia Ip3	N/A		
Statistics			
Nodes	7983	7470	4353
Elements	1260	898	664

TABLE 9
Orientation 1.1 refined > Geometry > Parts

Object Name	*Backplate Aluminum Casing*	*Left Endplate Aluminum Casing*	*Left Endplate Inner Steel slice*	*Left Endplate Outer Steel slice*	*Right Endplate Aluminum Casing*
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Aluminum		Stainless Steel		Aluminum
Stiffness Behavior	Flexible				Flexible
Brick Integration Scheme	Full				Full
Nonlinear Material Effects	Yes				
Thickness			1.2192 mm		
Thickness Mode			Manual		
Bounding Box					
Length X	4682.7 mm	2338.9 mm	2294.9 mm		2338.8 mm
Length Y	186.53 mm	4000.3 mm	3974.9 mm		4000.2 mm
Length Z	498.46 mm	1983.2 mm			1984. mm
Properties					
Volume	5.2863e+006 mm³	1.1673e+007 mm³	2.9149e+006 mm³		1.1919e+007 mm³
Mass	14.273 kg	31.518 kg	23.319 kg		32.181 kg
Centroid X	175.74 mm	-1178.2 mm			1201.6 mm
Centroid Y	3986.6 mm	1967.9 mm			2008.4 mm
Centroid Z	1225.6 mm	639.08 mm			651.27 mm
Moment of Inertia Ip1	7.8718e+005 kg·mm²	5.6821e+007 kg·mm²			6.0236e+007 kg·mm²
Moment of Inertia Ip2	3.0219e+007 kg·mm²	1.6143e+006 kg·mm²			1.6548e+006 kg·mm²
Moment of Inertia Ip3	2.9438e+007 kg·mm²	5.5221e+007 kg·mm²			5.8594e+007 kg·mm²
Surface Area (approx.)			2.3908e+006 mm²		
Statistics					
Nodes	1814	2125	138		2097
Elements	152	185	98		181

TABLE 10
Orientation 1.1 refined > Geometry > Parts

Object Name	*Right Endplate Outer Steel slice*	*Right Endplate Inner Steel Slice*	*Backplate Polyurethane*	*Backplate Outer steel slice*	*Back Plate Inner Steel slice*
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Stainless Steel		Polyurethane	Stainless Steel	
Nonlinear Material Effects	Yes				
Thickness	1.2192 mm			1.2192 mm	
Thickness Mode	Manual			Manual	
Stiffness Behavior			Flexible		
Brick Integration Scheme			Full		
Bounding Box					
Length X	2294.8 mm		4659.3 mm	4524.4 mm	
Length Y	3974.8 mm		180.41 mm	137.65 mm	
Length Z	1984. mm		476.92 mm	484.52 mm	
Properties					
Volume	2.9149e+006 mm³		1.1124e+008 mm³	2.7483e+006 mm³	
Mass	23.319 kg		26.698 kg	21.987 kg	
Surface Area (approx.)	2.3908e+006 mm²			2.2542e+006 mm²	
Centroid X			-0.24556 mm		
Centroid Y			3987.5 mm		
Centroid Z			1222.4 mm		
Moment of Inertia Ip1			5.1362e+005 kg·mm²		
Moment of Inertia Ip2			4.725e+007 kg·mm²		
Moment of Inertia Ip3			4.6748e+007 kg·mm²		
Statistics					
Nodes	146	142	1145	142	145
Elements	108	103	136	104	107

TABLE 11
Orientation 1.1 refined > Geometry > Parts

Object Name	*Left Hinge*	*Right Hinge*	*Hexcel*	*Hexcel Downstream Carbon sheet*	*Hexcel Upstream Carbon sheet*
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Stainless Steel		Hexcel	Carbon Fiber	

Stiffness Behavior	Flexible				
Brick Integration Scheme	Full				
Nonlinear Material Effects	Yes				
Thickness			0.254 mm		
Thickness Mode			Manual		
Bounding Box					
Length X	250.37 mm		4690.2 mm		4668.9 mm
Length Y	131.59 mm		3972.7 mm	3959. mm	3954.3 mm
Length Z	460.08 mm		1540. mm	1503.9 mm	1502.1 mm
Properties					
Volume	1.1945e+005 mm³		3.9184e+008 mm³	2.5864e+006 mm³	2.5635e+006 mm³
Mass	0.95562 kg		11.298 kg	1.5001 kg	1.4868 kg
Centroid X	-1527.6 mm	1521.7 mm	-9.3458e-013 mm		
Centroid Y	4011.7 mm	4012.3 mm	2682.8 mm		
Centroid Z	1231.9 mm	1229.6 mm	480.45 mm		
Moment of Inertia Ip1	18179 kg·mm²	18182 kg·mm²	1.1767e+007 kg·mm²		
Moment of Inertia Ip2	23155 kg·mm²	23160 kg·mm²	1.0328e+007 kg·mm²		
Moment of Inertia Ip3	4976.8 kg·mm²	4977.7 kg·mm²	2.2092e+007 kg·mm²		
Surface Area (approx.)				1.0183e+007 mm²	1.0092e+007 mm²
Statistics					
Nodes	89		697	331	346
Elements	8		72	277	292

Connections

TABLE 12
Orientation 1.1 refined > Connections

Object Name	*Connections*
State	Fully Defined
Auto Detection	
Generate Contact On Update	Yes
Tolerance Type	Slider
Tolerance Slider	0.
Tolerance Value	16.47 mm
Face/Face	Yes
Face/Edge	No
Edge/Edge	No
Priority	Include All
Same Body Grouping	Yes
Revolute Joints	Yes
Fixed Joints	Yes
Transparency	
Enabled	Yes

TABLE 13
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Bonded - Right Endplate Aluminum Casing To Backplate Aluminum Casing*	*Bonded - Left Endplate Aluminum Casing To Backplate Aluminum Casing*	*Bonded - Mylar To Backplate Aluminum Casing*	*Bonded - Mylar To Left Endplate Aluminum Casing*	*Bonded - Mylar To Right Endplate Aluminum Casing*
State	Fully Defined		Suppressed		
Scope					
Scoping Method	Geometry Selection				
Contact	1 Edge		No Selection		
Target	1 Edge		No Selection		
Contact Bodies	Right Endplate Aluminum Casing	Left Endplate Aluminum Casing	Mylar		
Target Bodies	Backplate Aluminum Casing		No Selection		
Definition					
Type	Bonded				
Scope Mode	Manual				
Suppressed	No				
Behavior				Symmetric	
Advanced					
Formulation	Pure Penalty				
Normal Stiffness	Program Controlled				
Update Stiffness	Never				
Thermal Conductance	Program Controlled				
Pinball Region	Radius		Auto Detection Value		
Pinball Radius	100. mm				

TABLE 14
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 6*	*Contact Region 7*	*Contact Region 8*	*Contact Region 9*	*Contact Region 10*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Rod 4		Rod 5		Rod 6
Target Bodies	Left Endplate Aluminum Casing	Right Endplate Aluminum Casing	Left Endplate Aluminum Casing	Right Endplate Aluminum Casing	Left Endplate Aluminum Casing
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					
Formulation	Pure Penalty				
Normal Stiffness	Program Controlled				

Update Stiffness	Never
Thermal Conductance	Program Controlled
Pinball Region	Program Controlled

TABLE 15
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 11*	*Contact Region 12*	*Contact Region 13*	*Contact Region 14*	*Contact Region 15*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Rod 6	Rod 1		Rod 2	
Target Bodies	Right Endplate Aluminum Casing	Left Endplate Aluminum Casing	Right Endplate Aluminum Casing	Left Endplate Aluminum Casing	Right Endplate Aluminum Casing
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					
Formulation	Pure Penalty				
Normal Stiffness	Program Controlled				
Update Stiffness	Never				
Thermal Conductance	Program Controlled				
Pinball Region	Program Controlled				

TABLE 16
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 16*	*Contact Region 17*	*Contact Region 18*	*Contact Region 20*	*Contact Region 21*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face		2 Faces	1 Face	2 Faces
Target	1 Face		2 Faces	1 Face	2 Faces
Contact Bodies	Rod 3		Nose Plate		
Target Bodies	Left Endplate Aluminum Casing	Right Endplate Aluminum Casing	Left Endplate Aluminum Casing	Left Endplate Inner Steel slice	Right Endplate Aluminum Casing
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					

Formulation	Pure Penalty
Normal Stiffness	Program Controlled
Update Stiffness	Never
Thermal Conductance	Program Controlled
Pinball Region	Program Controlled

TABLE 17
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 23*	*Contact Region 25*	*Contact Region 26*	*Contact Region 29*	*Contact Region 30*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Nose Plate	Left Endplate Downstream Hole area		Right Endplate Upstream Hole area	
Target Bodies	Right Endplate Inner Steel Slice	Left Endplate Inner Steel slice	Left Endplate Outer Steel slice	Right Endplate Outer Steel slice	Right Endplate Inner Steel Slice
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					
Formulation	Pure Penalty				
Normal Stiffness	Program Controlled				
Update Stiffness	Never				
Thermal Conductance	Program Controlled				
Pinball Region	Program Controlled				

TABLE 18
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 31*	*Contact Region 32*	*Contact Region 33*	*Contact Region 34*	*Contact Region 35*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	4 Faces	1 Face		2 Faces	
Target	4 Faces	1 Face		2 Faces	
Contact Bodies	Backplate Aluminum Casing				
Target Bodies	Backplate Polyurethane	Backplate Outer steel slice	Back Plate Inner Steel slice	Left Hinge	Right Hinge
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					
Formulation	Pure Penalty				

Normal Stiffness	Program Controlled
Update Stiffness	Never
Thermal Conductance	Program Controlled
Pinball Region	Program Controlled

TABLE 19
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 41*	*Contact Region 42*	*Contact Region 49*	*Contact Region 50*	*Contact Region 53*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Left Endplate Aluminum Casing		Right Endplate Aluminum Casing		Backplate Polyurethane
Target Bodies	Left Endplate Inner Steel slice	Left Endplate Outer Steel slice	Right Endplate Outer Steel slice	Right Endplate Inner Steel Slice	Backplate Outer steel slice
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					
Formulation	Pure Penalty				
Normal Stiffness	Program Controlled				
Update Stiffness	Never				
Thermal Conductance	Program Controlled				
Pinball Region	Program Controlled				

TABLE 20
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 54*	*Contact Region 55*	*Contact Region 56*	*Contact Region 57*	*Contact Region 58*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face			2 Faces	
Contact Bodies	Backplate Polyurethane			Backplate Outer steel slice	
Target Bodies	Back Plate Inner Steel slice	Left Hinge	Right Hinge	Left Hinge	Right Hinge
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					
Formulation	Pure Penalty				
Normal Stiffness	Program Controlled				

Update Stiffness	Never
Thermal Conductance	Program Controlled
Pinball Region	Program Controlled

TABLE 21
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 43*	*Contact Region 44*	*Contact Region 45*	*Contact Region 46*	*Contact Region 47*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	2 Faces		1 Face		
Target	2 Faces		1 Face		
Contact Bodies	Nose Plate			Left Endplate Upstream Hole area	
Target Bodies	Left Endplate Polyurethane	Right Endplate Polyurethane	Hexcel Downstream Carbon sheet	Left Endplate Inner Steel slice	Left Endplate Outer Steel slice
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					
Formulation	Pure Penalty				
Normal Stiffness	Program Controlled				
Update Stiffness	Never				
Thermal Conductance	Program Controlled				
Pinball Region	Program Controlled				

TABLE 22
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 48*	*Contact Region 51*	*Contact Region 52*	*Contact Region 59*	*Contact Region 60*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	4 Faces	1 Face			4 Faces
Target	4 Faces	1 Face			4 Faces
Contact Bodies	Left Endplate Polyurethane				Right Endplate Polyurethane
Target Bodies	Left Endplate Aluminum Casing	Left Endplate Inner Steel slice	Left Endplate Outer Steel slice	Hexcel	Right Endplate Aluminum Casing
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					

Formulation	Pure Penalty
Normal Stiffness	Program Controlled
Update Stiffness	Never
Thermal Conductance	Program Controlled
Pinball Region	Program Controlled

TABLE 23
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 61*	*Contact Region 62*	*Contact Region 63*	*Contact Region 64*	*Contact Region 65*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Right Endplate Polyurethane			Right Endplate Downstream Hole area	
Target Bodies	Right Endplate Outer Steel slice	Right Endplate Inner Steel Slice	Hexcel	Right Endplate Outer Steel slice	Right Endplate Inner Steel Slice
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					
Formulation	Pure Penalty				
Normal Stiffness	Program Controlled				
Update Stiffness	Never				
Thermal Conductance	Program Controlled				
Pinball Region	Program Controlled				

TABLE 24
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 66*	*Contact Region 67*	*Contact Region 68*	*Contact Region 69*	*Contact Region 70*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face	2 Faces	1 Face		
Target	1 Face				
Contact Bodies	Backplate Aluminum Casing		Left Endplate Aluminum Casing		Left Endplate Inner Steel slice
Target Bodies	Hexcel	Hexcel Downstream Carbon sheet	Hexcel	Hexcel Downstream Carbon sheet	Hexcel
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					
Formulation	Pure Penalty				

Normal Stiffness	Program Controlled
Update Stiffness	Never
Thermal Conductance	Program Controlled
Pinball Region	Program Controlled

TABLE 25
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 71*	*Contact Region 72*	*Contact Region 73*	*Contact Region 74*	*Contact Region 75*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Right Endplate Aluminum Casing	Right Endplate Inner Steel Slice	Backplate Polyurethane		Back Plate Inner Steel slice
Target Bodies	Hexcel			Hexcel Downstream Carbon sheet	Hexcel
Definition					
Type	Bonded				
Scope Mode	Automatic				
Behavior	Symmetric				
Suppressed	No				
Advanced					
Formulation	Pure Penalty				
Normal Stiffness	Program Controlled				
Update Stiffness	Never				
Thermal Conductance	Program Controlled				
Pinball Region	Program Controlled				

TABLE 26
Orientation 1.1 refined > Connections > Contact Regions

Object Name	*Contact Region 76*	*Contact Region 77*
State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Contact	1 Face	
Target	1 Face	
Contact Bodies	Hexcel	
Target Bodies	Hexcel Downstream Carbon sheet	Hexcel Upstream Carbon sheet
Definition		
Type	Bonded	
Scope Mode	Automatic	
Behavior	Symmetric	
Suppressed	No	
Advanced		
Formulation	Pure Penalty	
Normal Stiffness	Program Controlled	
Update Stiffness	Never	
Thermal Conductance	Program Controlled	

Pinball Region	Program Controlled

Mesh

TABLE 27
Orientation 1.1 refined > Mesh

Object Name	*Mesh*
State	Solved
Defaults	
Physics Preference	Mechanical
Relevance	-35
Advanced	
Relevance Center	Fine
Element Size	Default
Shape Checking	Standard Mechanical
Solid Element Midside Nodes	Program Controlled
Straight Sided Elements	No
Initial Size Seed	Active Assembly
Smoothing	Low
Transition	Fast
Statistics	
Nodes	154686
Elements	23855

Named Selections

TABLE 28
Orientation 1.1 refined > Named Selections > Named Selections

Object Name	*Problematic Geometry*	*Problematic Geometry 2*
State	Suppressed	
Scope		
Geometry	No Selection	
Statistics		
Type	Manual	
Total Selection	No Selection	
Suppressed	0	
Hidden	0	

Static Structural

TABLE 29
Orientation 1.1 refined > Analysis

Object Name	*Static Structural*
State	Fully Defined
Definition	
Physics Type	Structural
Analysis Type	Static Structural
Options	
Reference Temp	22. °C

TABLE 30
Orientation 1.1 refined > Static Structural > Analysis Settings

Object Name	*Analysis Settings*
State	Fully Defined
Step Controls	
Number Of Steps	1.
Current Step Number	1.
Step End Time	1. s
Auto Time Stepping	Program Controlled
Solver Controls	
Solver Type	Direct
Weak Springs	On
Spring Stiffness	Program Controlled
Large Deflection	On
Inertia Relief	Off
Nonlinear Controls	
Force Convergence	Program Controlled
Moment Convergence	Program Controlled
Displacement Convergence	Program Controlled
Rotation Convergence	Program Controlled
Line Search	Program Controlled
Output Controls	
Calculate Stress	Yes
Calculate Strain	Yes
Calculate Results At	All Time Points
Analysis Data Management	
Solver Files Directory	C:\Documents and Settings\Jinnuri\Desktop\website\Al slit\Max Def orien\Analysis 4 \Analysis 4 Simulation Files\Static Structural\
Future Analysis	None
Save ANSYS db	No
Delete Unneeded Files	Yes
Nonlinear Solution	Yes

FIGURE 1
Orientation 1.1 refined > Static Structural > Figure

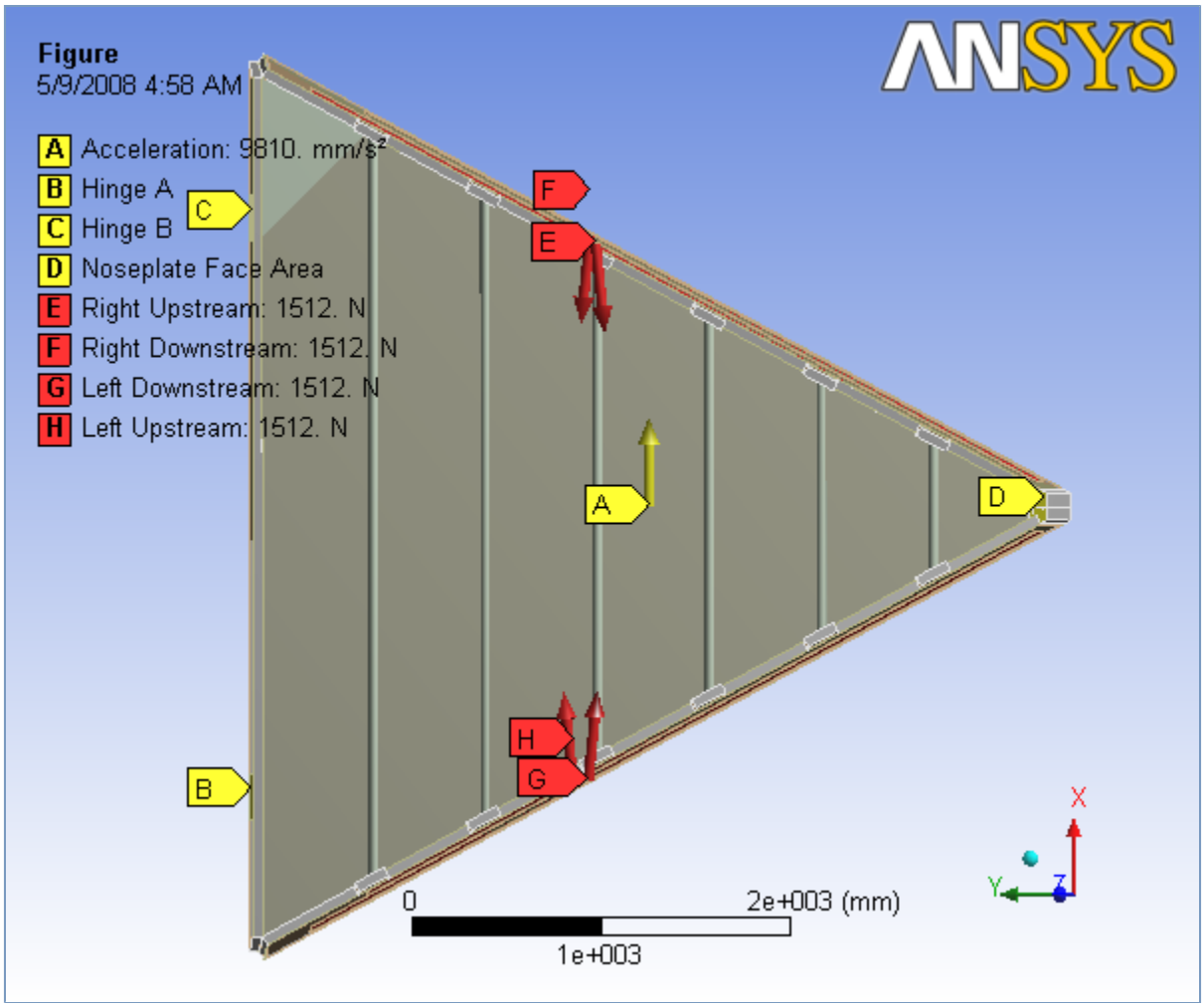


TABLE 31
Orientation 1.1 refined > Static Structural > Accelerations

Object Name	*Acceleration*
State	Fully Defined
Scope	
Geometry	All Bodies
Definition	
Define By	Vector
Magnitude	9810. mm/s² (ramped)
Direction	Defined
Suppressed	No

FIGURE 2
Orientation 1.1 refined > Static Structural > Acceleration

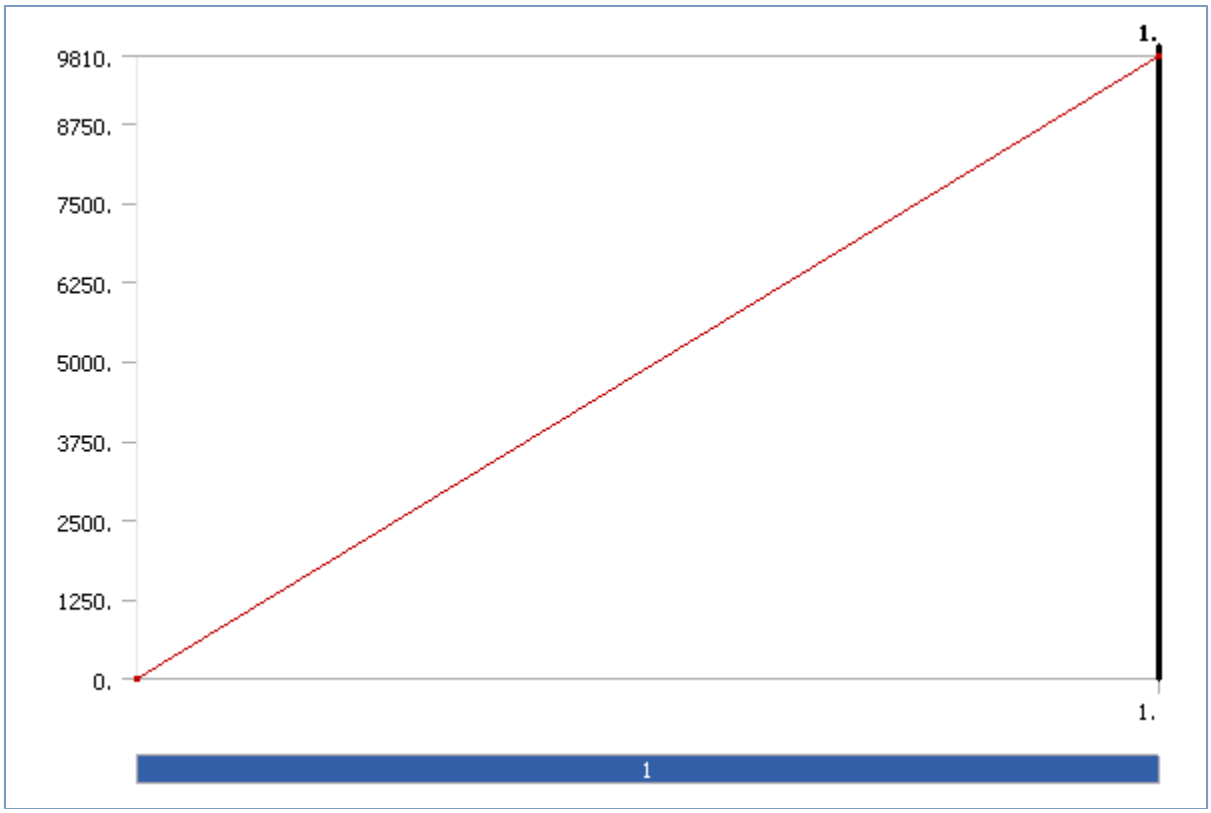


TABLE 32
Orientation 1.1 refined > Static Structural > Loads

Object Name	*Hinge A*	*Hinge B*	*Noseplate Face Area*	*Right Upstream*	*Right Downstream*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Geometry	1 Face				
Definition					
Define By	Components				
Type	Displacement			Force	
X Component	Free	0. mm (ramped)		-1503.7 N (ramped)	
Y Component	0. mm (ramped)	Free		-158.05 N (ramped)	158.05 N (ramped)
Z Component	0. mm (ramped)			0. N (ramped)	
Suppressed	No				

FIGURE 3
Orientation 1.1 refined > Static Structural > Hinge A

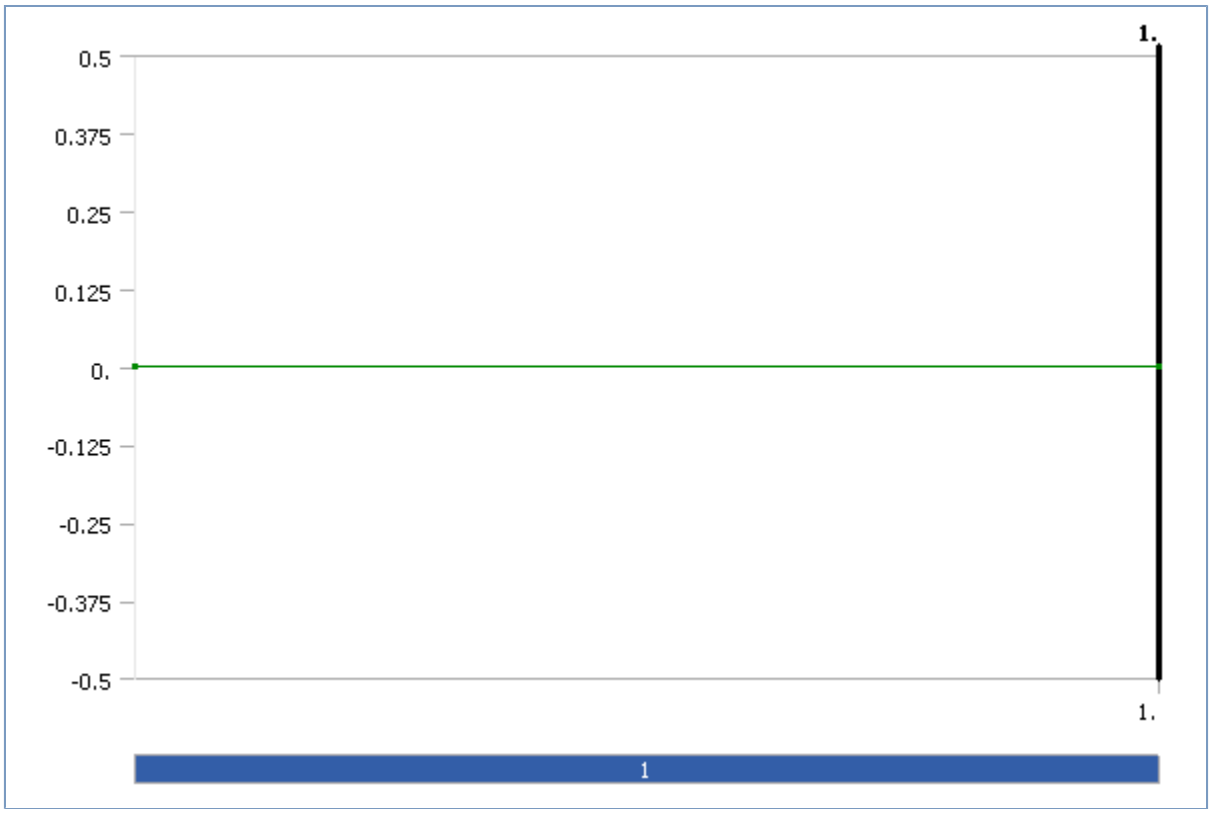


FIGURE 4
Orientation 1.1 refined > Static Structural > Hinge B

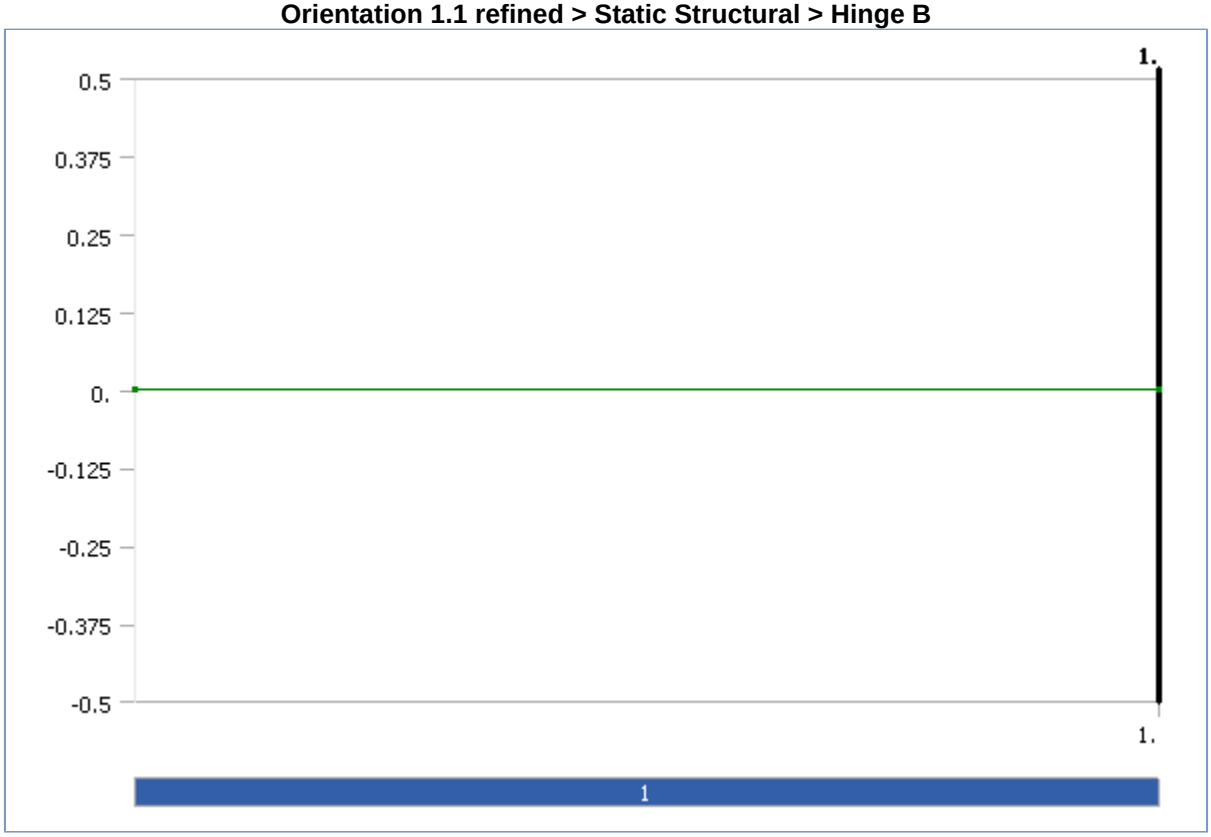


FIGURE 5
Orientation 1.1 refined > Static Structural > Noseplate Face Area

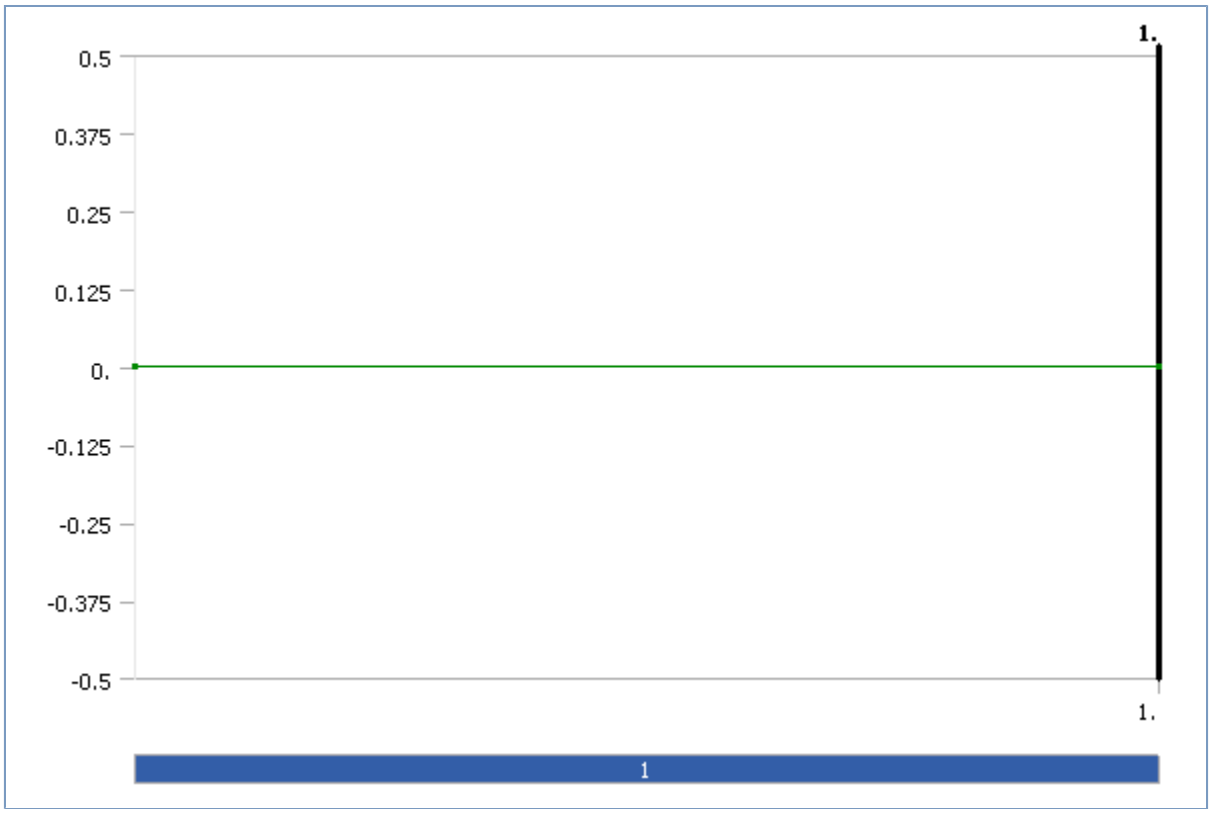


FIGURE 6
Orientation 1.1 refined > Static Structural > Right Upstream

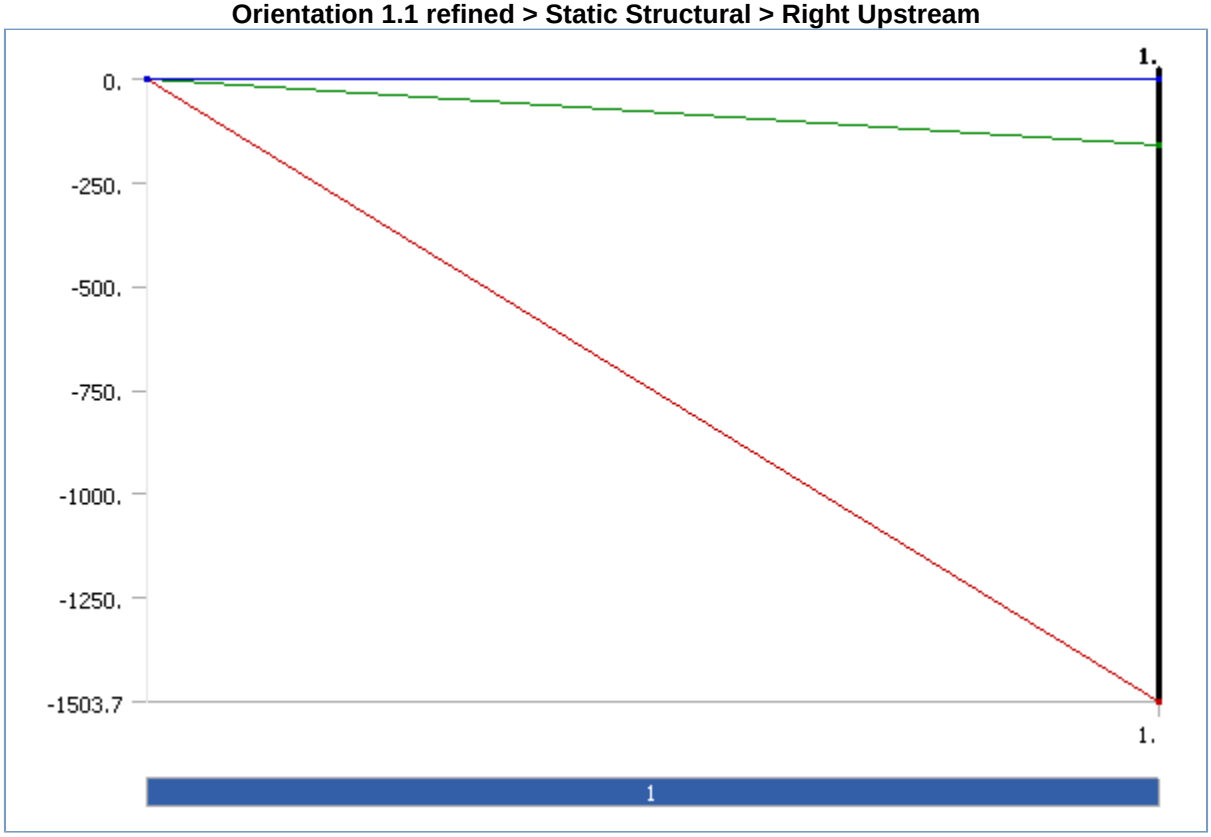


FIGURE 7
Orientation 1.1 refined > Static Structural > Right Downstream

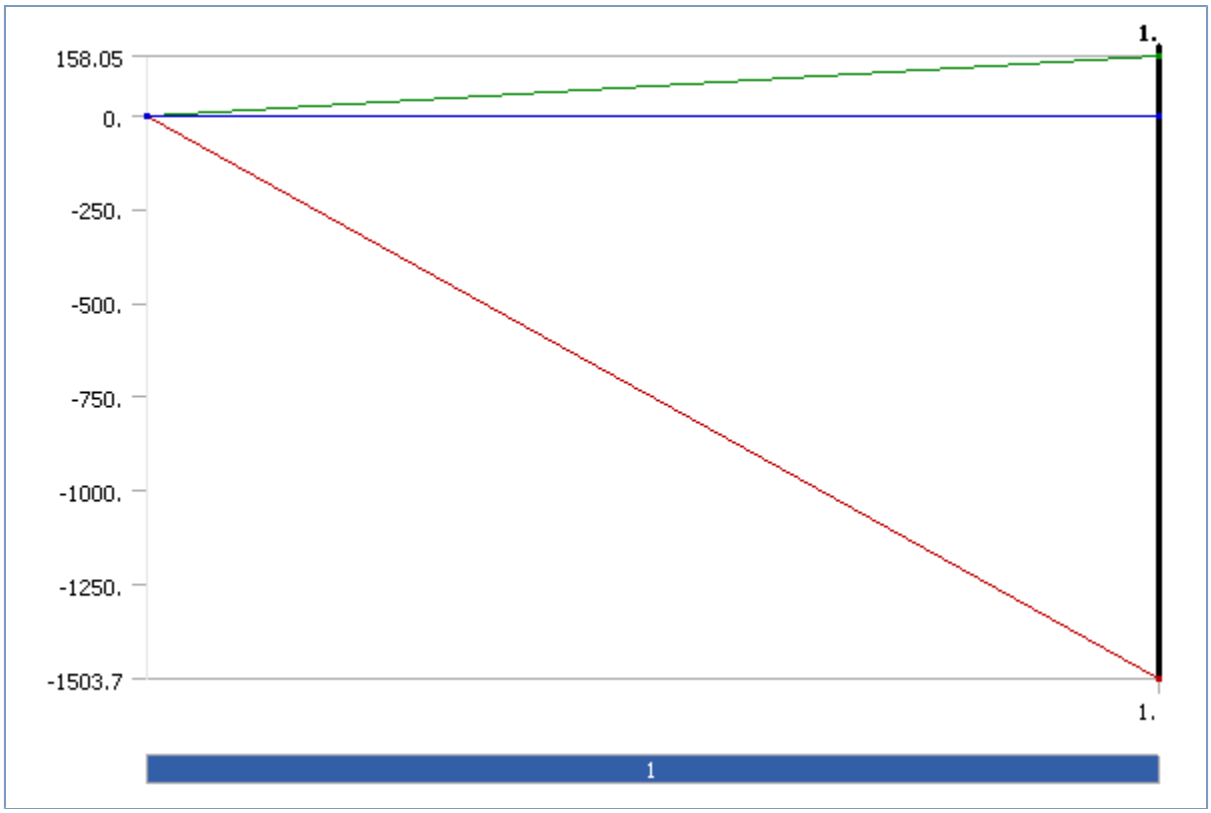


TABLE 33
Orientation 1.1 refined > Static Structural > Loads

Object Name	*Left Upstream*	*Left Downstream*
State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Geometry	1 Face	
Definition		
Define By	Components	
Type	Force	
X Component	1503.7 N (ramped)	
Y Component	158.05 N (ramped)	-158.05 N (ramped)
Z Component	0. N (ramped)	
Suppressed	No	

FIGURE 8
Orientation 1.1 refined > Static Structural > Left Upstream

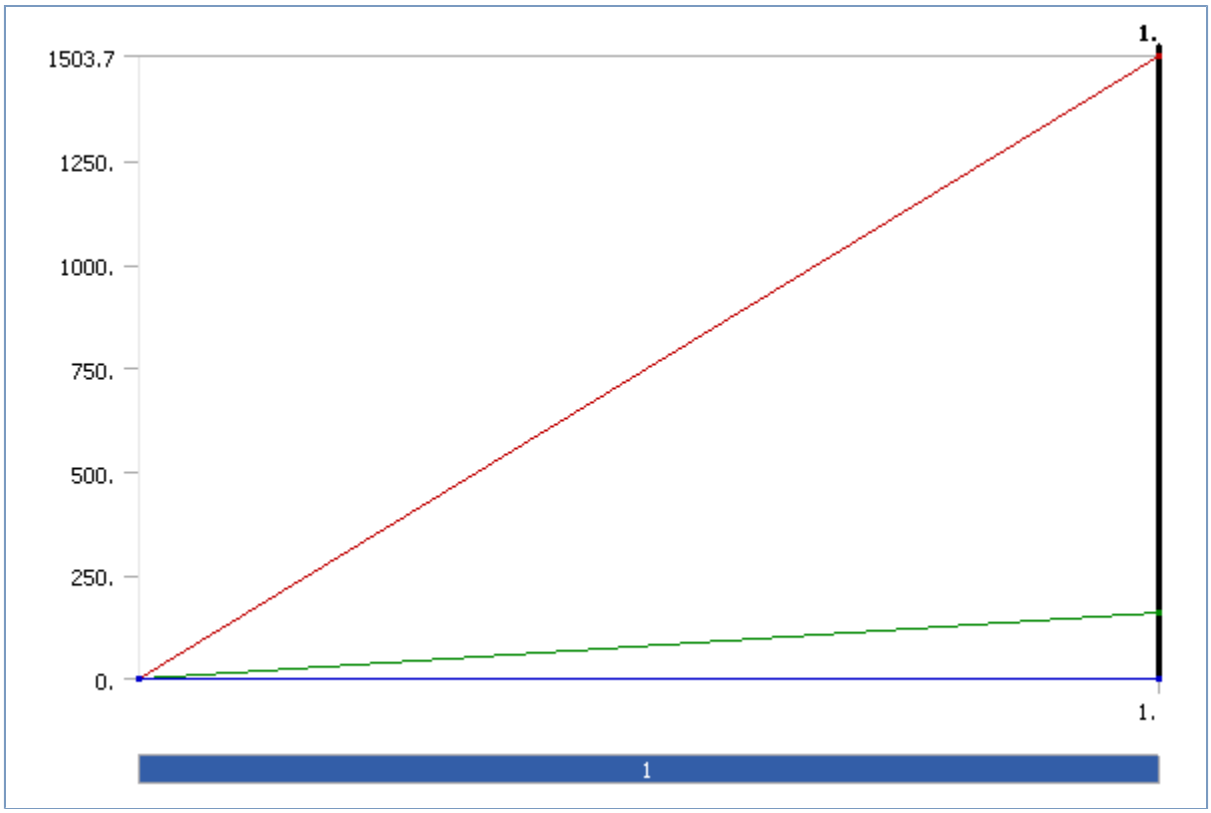
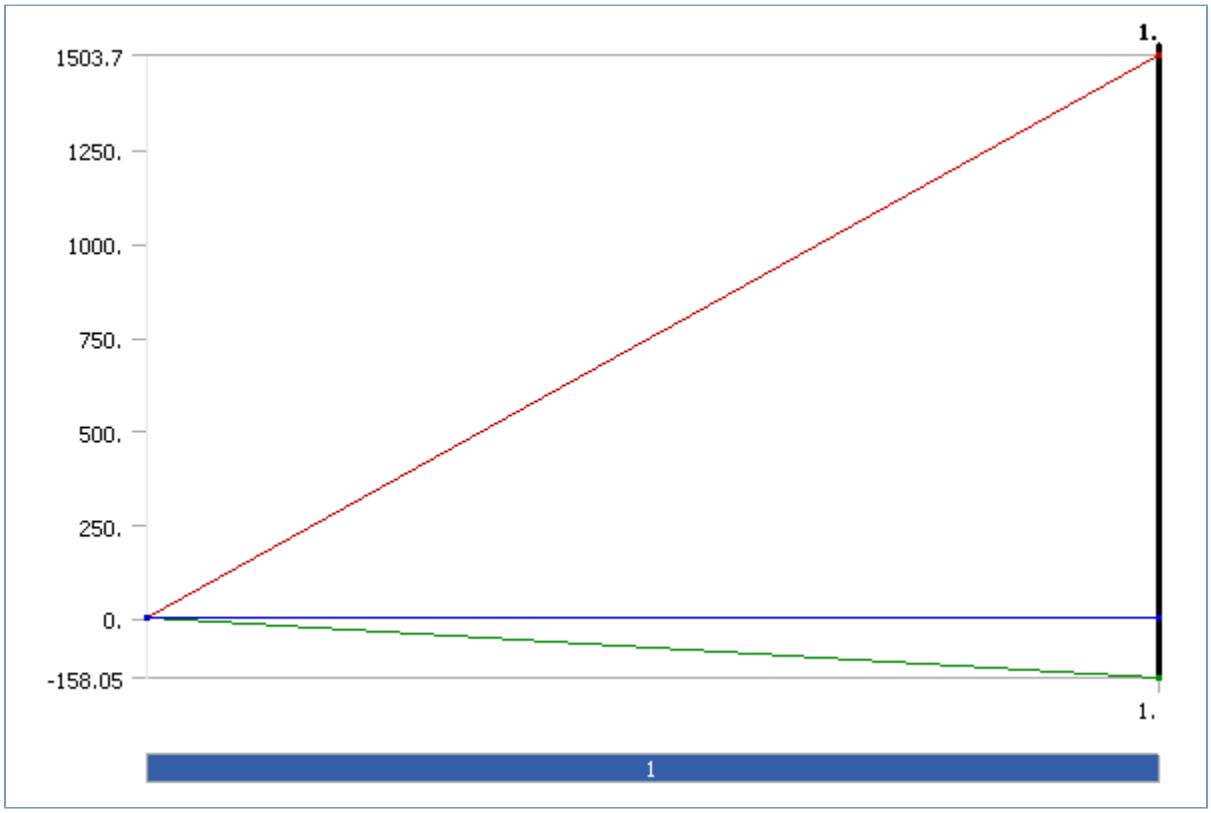


FIGURE 9
Orientation 1.1 refined > Static Structural > Left Downstream



Solution

TABLE 34
Orientation 1.1 refined > Static Structural > Solution

Object Name	*Solution*
State	Solved
Adaptive Mesh Refinement	
Max Refinement Loops	1.
Refinement Depth	2.

TABLE 35
Orientation 1.1 refined > Static Structural > Solution > Solution Information

Object Name	*Solution Information*
State	Solved
Solution Information	
Solution Output	Solver Output
Newton-Raphson Residuals	0
Update Interval	2.5 s
Display Points	All

TABLE 36
Orientation 1.1 refined > Static Structural > Solution > Results

Object Name	*Total Deformation*	*X - Directional Deformation*	*Y - Directional Deformation*	*Z - Directional Deformation*	*Equivalent Stress*
State	Solved				
Scope					
Geometry	All Bodies				
Definition					
Type	Total Deformation	Directional Deformation			Equivalent (von-Mises) Stress
Display Time	End Time				
Orientation		X Axis	Y Axis	Z Axis	
Shell					Top/Bottom
Results					
Minimum	1.0505e-003 mm	-4.0381e-002 mm	-1.4281e-002 mm	-3.2153e-003 mm	2.5666e-005 MPa
Maximum	4.3599e-002 mm	2.1782e-003 mm	2.7598e-002 mm	2.7701e-002 mm	1.7596 MPa
Minimum Occurs On	Backplate Outer steel slice	Right Endplate Aluminum Casing	Rod 5	Rod 4	Backplate Polyurethane
Maximum Occurs On	Right Endplate Aluminum Casing	Left Endplate Outer Steel slice	Rod 6		Rod 2
Information					
Time	1. s				
Load Step	1				
Substep	1				
Iteration Number	3				

FIGURE 10
Orientation 1.1 refined > Static Structural > Solution > Total Deformation > Figure

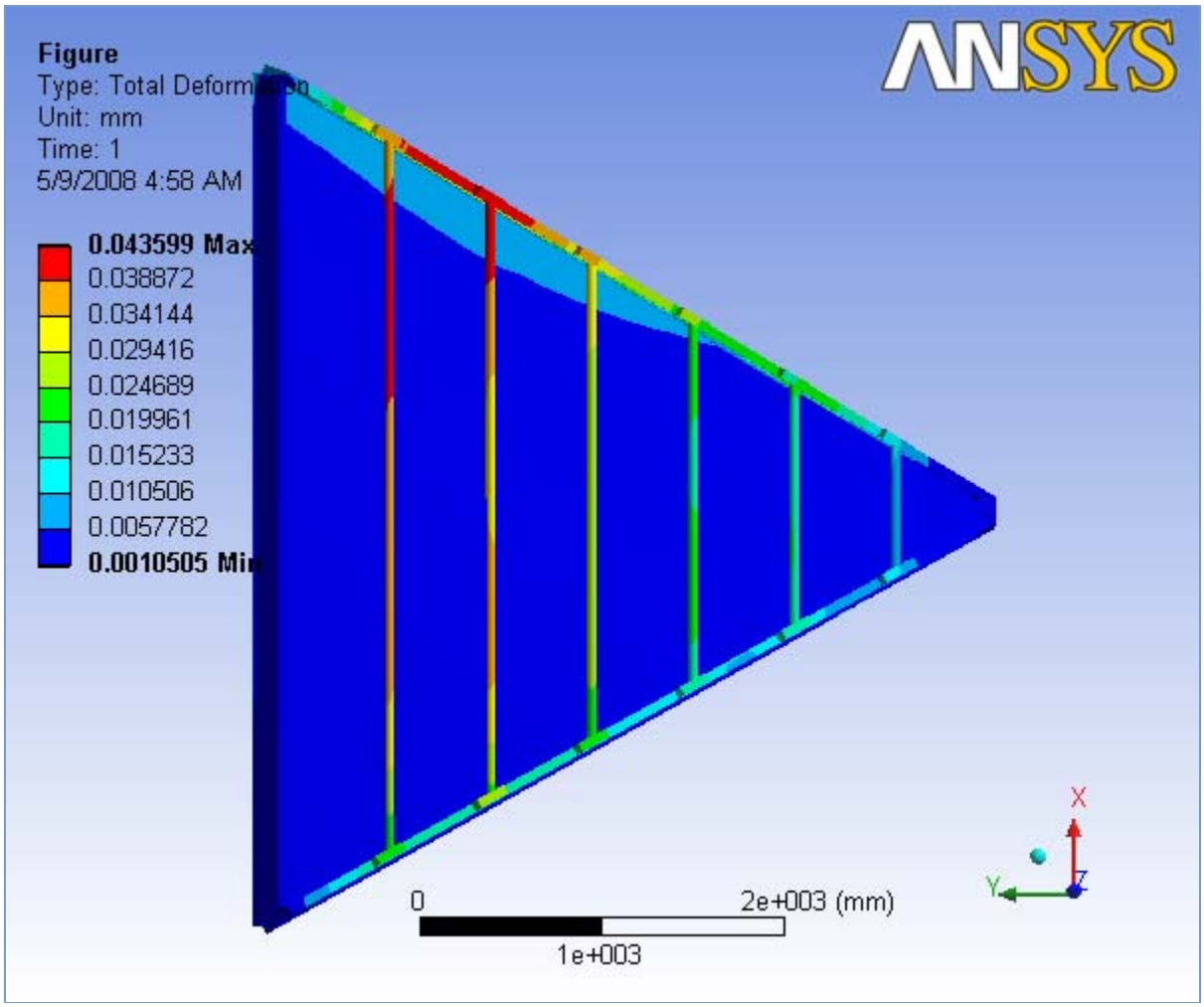


FIGURE 11
Orientation 1.1 refined > Static Structural > Solution > X - Directional Deformation > Figure

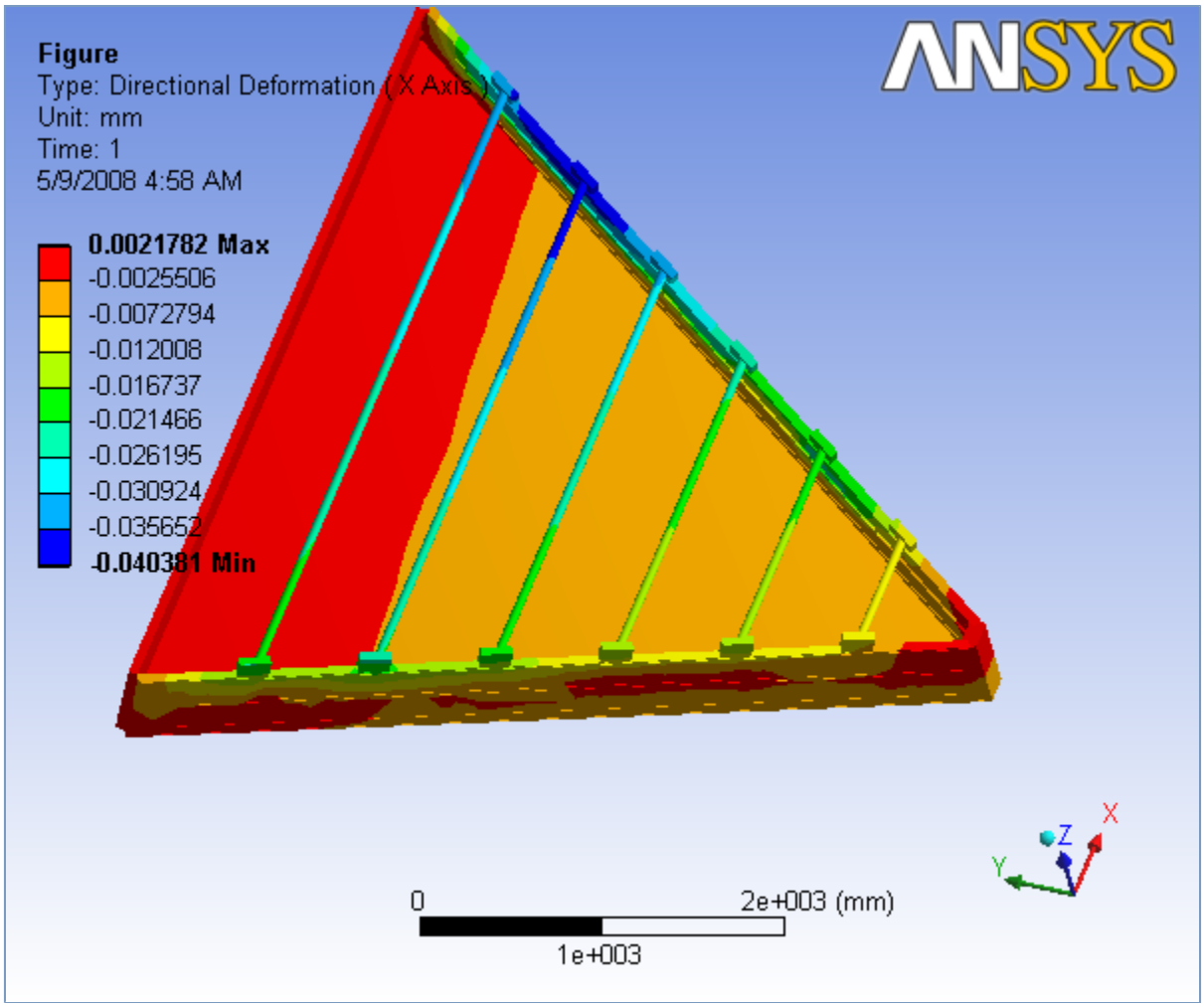


FIGURE 12
Orientation 1.1 refined > Static Structural > Solution > Y - Directional Deformation > Figure

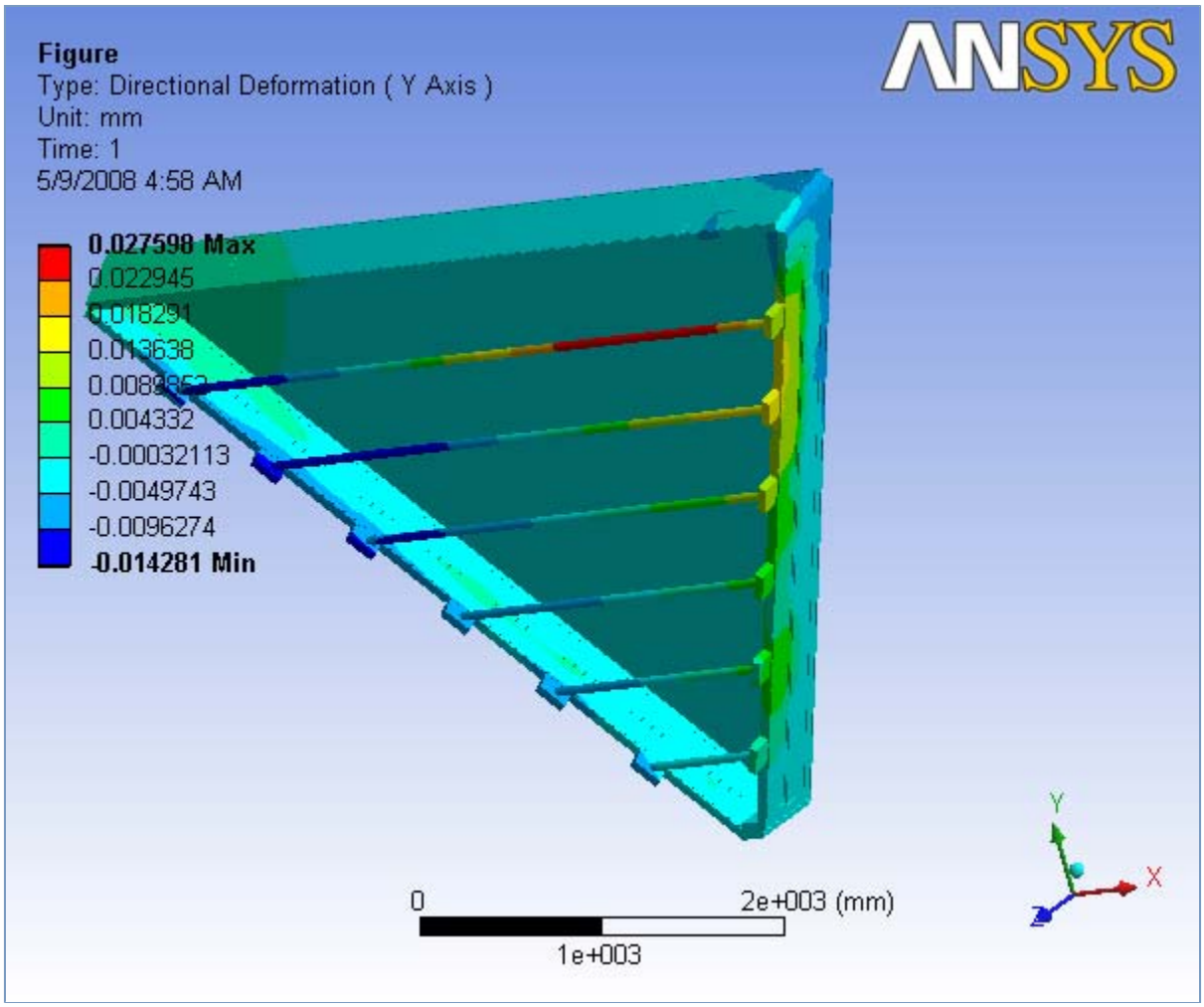


FIGURE 13
Orientation 1.1 refined > Static Structural > Solution > Z - Directional Deformation > Figure

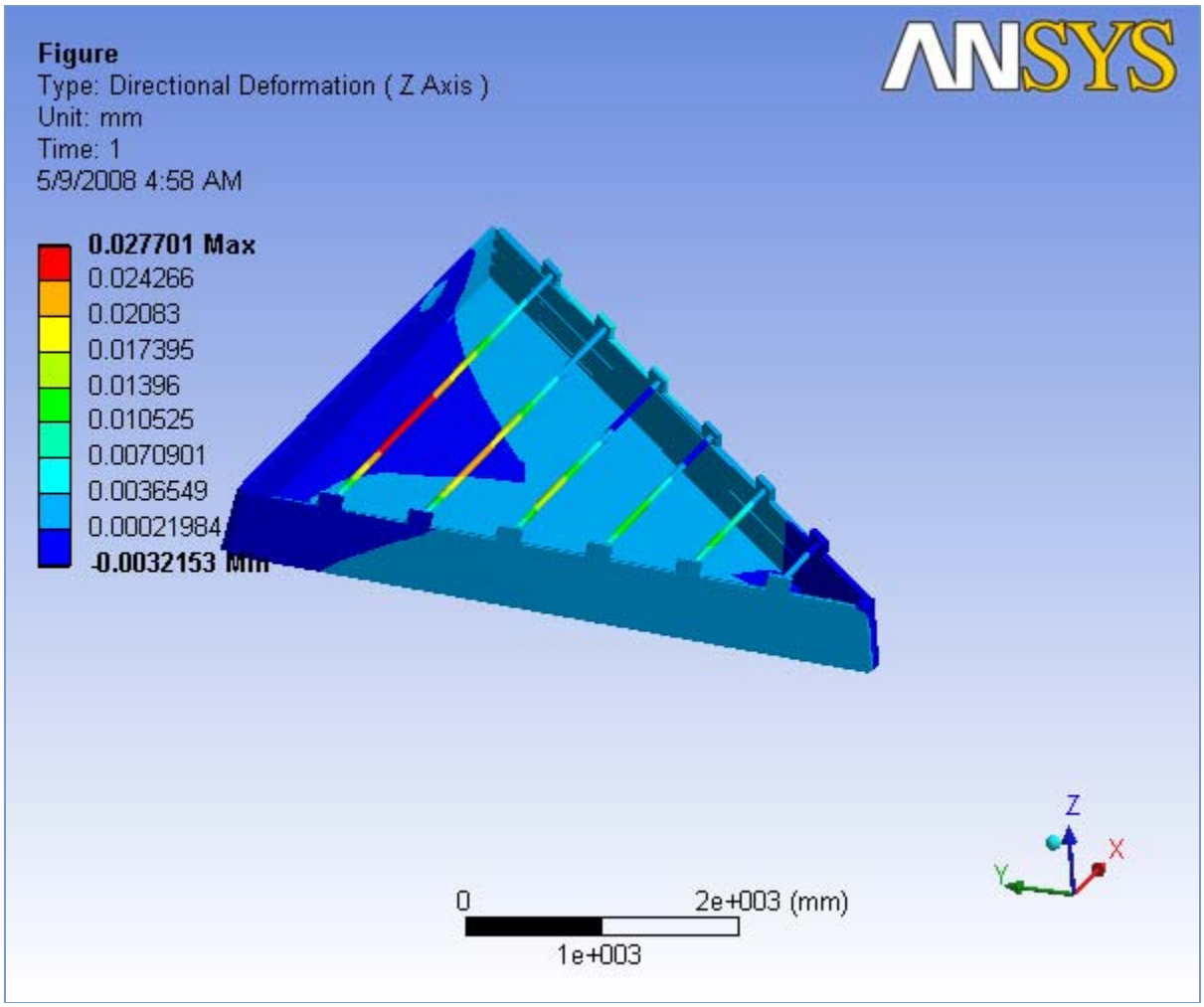


FIGURE 14
Orientation 1.1 refined > Static Structural > Solution > Equivalent Stress > Figure

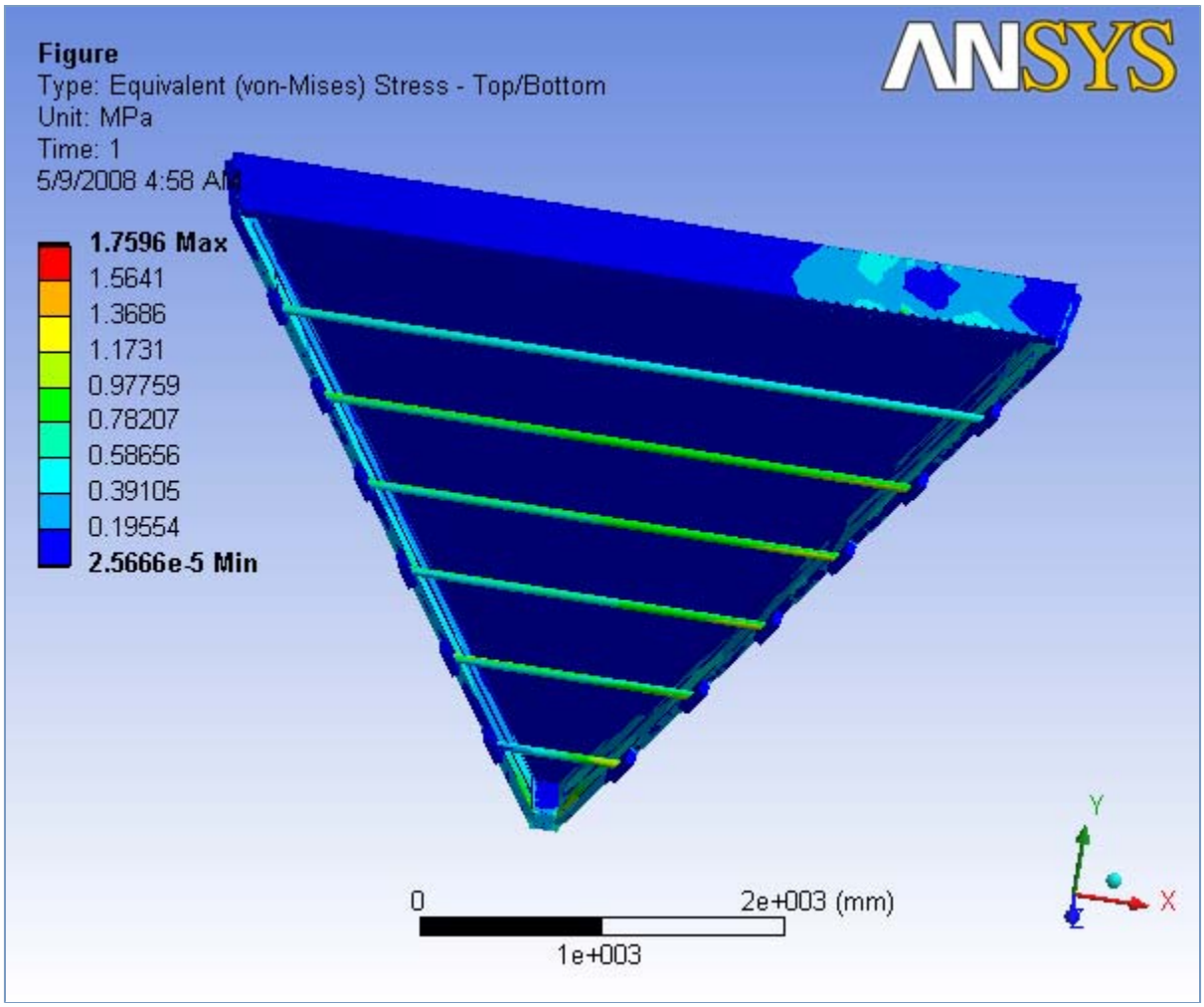
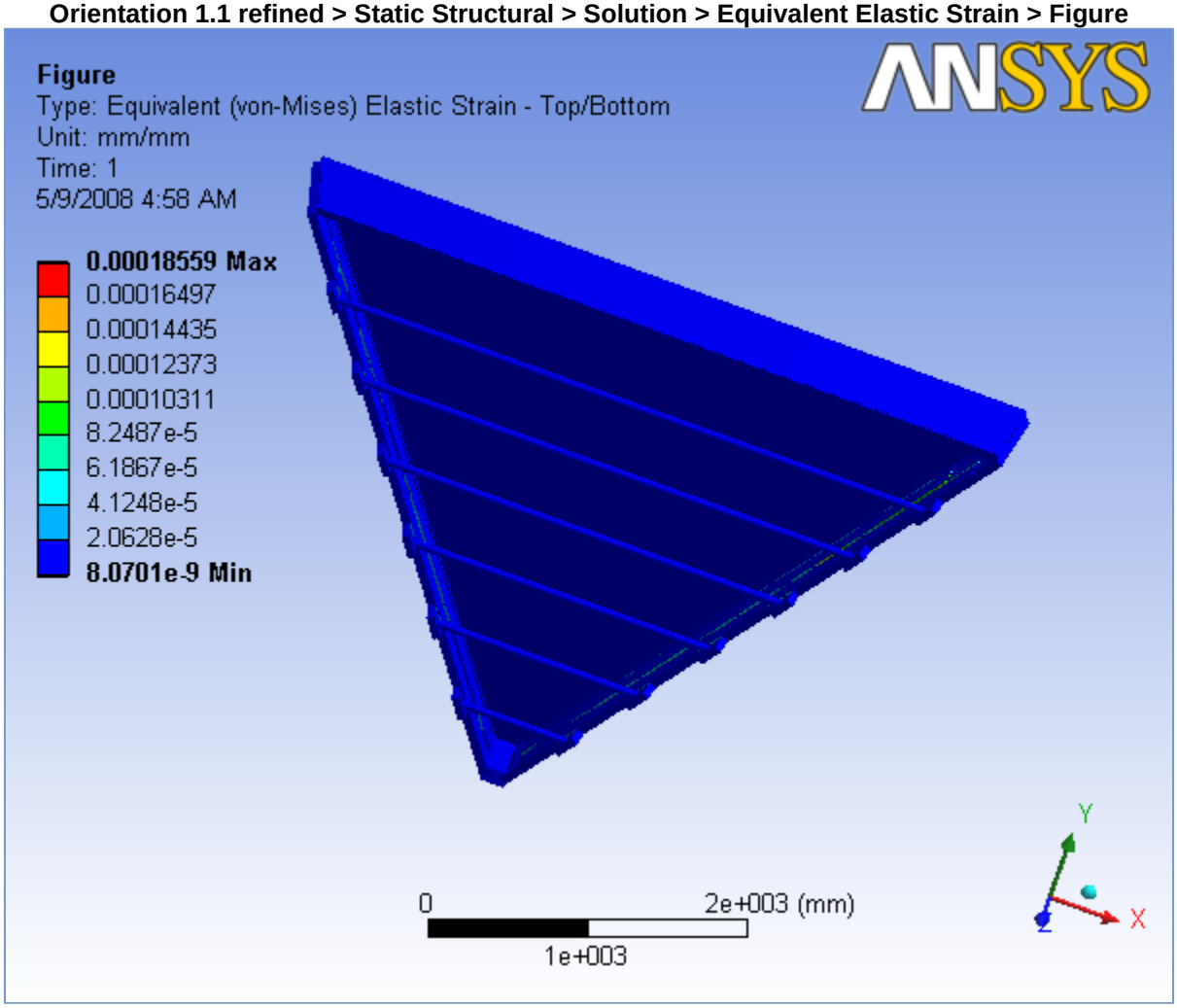


TABLE 37
Orientation 1.1 refined > Static Structural > Solution > Results

Object Name	*Equivalent Elastic Strain*
State	Solved
Scope	
Geometry	All Bodies
Definition	
Type	Equivalent (von-Mises) Elastic Strain
Shell	Top/Bottom
Display Time	End Time
Results	
Minimum	8.0701e-009 mm/mm
Maximum	1.8559e-004 mm/mm
Minimum Occurs On	Hexcel Downstream Carbon sheet
Maximum Occurs On	Right Endplate Polyurethane
Information	
Time	1. s
Load Step	1
Substep	1
Iteration Number	3

FIGURE 15

Orientation 1.1 refined > Static Structural > Solution > Equivalent Elastic Strain > Figure



Material Data

Carbon Fiber

TABLE 38
Carbon Fiber > Constants

Structural	
Young's Modulus	1.5e+005 MPa
Poisson's Ratio	0.3
Density	5.8e-007 kg/mm³
Thermal Expansion	0. 1/°C
Thermal	
Thermal Conductivity	0. W/mm·°C
Specific Heat	0. J/kg·°C
Electromagnetics	
Relative Permeability	0.
Resistivity	0. Ohm·mm

Stainless Steel

TABLE 39
Stainless Steel > Constants

Structural	
Young's Modulus	1.93e+005 MPa
Poisson's Ratio	0.3
Density	8.e-006 kg/mm³
Thermal Expansion	0. 1/°C
Thermal	
Thermal Conductivity	0. W/mm·°C
Specific Heat	0. J/kg·°C
Electromagnetics	
Relative Permeability	0.
Resistivity	0. Ohm·mm

Aluminum

TABLE 40
Aluminum > Constants

Structural	
Young's Modulus	68900 MPa
Poisson's Ratio	0.33
Density	2.7e-006 kg/mm³
Thermal Expansion	2.3e-005 1/°C
Thermal	
Thermal Conductivity	0. W/mm·°C
Specific Heat	0. J/kg·°C
Electromagnetics	
Relative Permeability	0.
Resistivity	0. Ohm·mm

Polyurethane

TABLE 41
Polyurethane > Constants

Structural	
Young's Modulus	66. MPa
Poisson's Ratio	0.3
Density	2.4e-007 kg/mm³
Thermal Expansion	6.12e-005 1/°C
Thermal	
Thermal Conductivity	0. W/mm·°C
Specific Heat	0. J/kg·°C
Electromagnetics	
Relative Permeability	0.
Resistivity	0. Ohm·mm

Hexcel

TABLE 42
Hexcel > Constants

Structural	

Young's Modulus	1.4805e+005 MPa
Poisson's Ratio	0.33
Density	2.8833e-008 kg/mm³
Thermal Expansion	0. 1/°C
Thermal	
Thermal Conductivity	0. W/mm·°C
Specific Heat	0. J/kg·°C
Electromagnetics	
Relative Permeability	0.
Resistivity	0. Ohm·mm