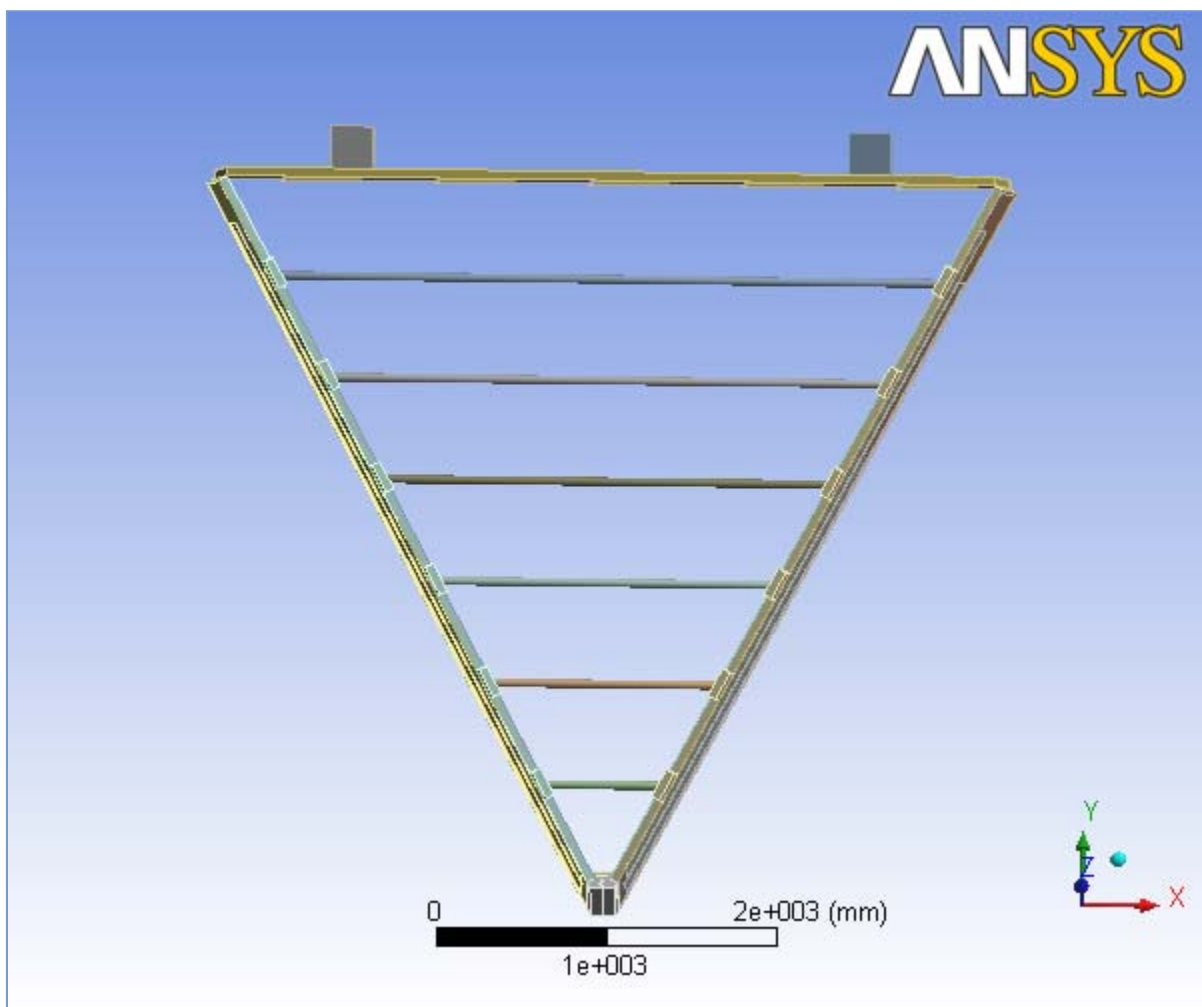




Analysis 2.1

<i>Author</i>	<i>Kalyan Jinnuri</i>
<i>Subject</i>	<i>Ideal Case with Gravity and Rods (No Wire Tensions, No hexcel)</i>
<i>Prepared for</i>	<i>Region 3 Drift chamber Design</i>
<i>First Saved</i>	<i>Friday, April 25, 2008</i>
<i>Last Saved</i>	<i>Thursday, May 01, 2008</i>
<i>Product Version</i>	<i>11.0 Release</i>



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Units

TABLE 1

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

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar)

Geometry

TABLE 2

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Geometry

Object Name	<i>Geometry</i>
State	Fully Defined
Definition	
Source	C:\Documents and Settings\Jinnuri\Desktop\website\R3_2.agdb
Type	DesignModeler
Length Unit	Millimeters
Element Control	Program Controlled
Display Style	Part Color
Bounding Box	
Length X	4768.3 mm
Length Y	4317.7 mm
Length Z	2060. mm
Properties	
Volume	4.5833e+008 mm ³

Mass	331.4 kg
Statistics	
Bodies	28
Active Bodies	28
Nodes	156969
Elements	24894
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
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Geometry > Parts

Object Name	<i>Nose Plate</i>	<i>Left Endplate Downstream Hole area</i>	<i>Right Endplate Upstream Hole area</i>	<i>Left Endplate Upstream Hole area</i>	<i>Left Endplate Aluminum Casing</i>
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Aluminum	Polyurethane			Aluminum
Stiffness Behavior	Flexible				
Nonlinear Material Effects	Yes				
Bounding Box					
Length X	180.6 mm	2159.8 mm	2116.2 mm	1973.8 mm	2338.9 mm
Length Y	94.006 mm	3690. mm	3614.6 mm	3368. mm	4000.3 mm
Length Z	529.95 mm	1562.8 mm	1531.7 mm	1437.5 mm	1983.2 mm
Properties					
Volume	6.6319e+006 mm ³	4.3107e+007 mm ³	4.1332e+007 mm ³	3.8462e+007 mm ³	1.1673e+007 mm ³
Mass	17.906 kg	10.346 kg	9.9198 kg	9.2309 kg	31.518 kg
Centroid X	-1.8724e-016 mm	-1157.7 mm	1145.5 mm	-1057.2 mm	-1178.2 mm
Centroid Y	42.65 mm	1932.5 mm	1911.3 mm	1758.4 mm	1967.9 mm

Centroid Z	-263.29 mm	368. mm	587.1 mm	528.73 mm	639.08 mm
Moment of Inertia Ip1	4.2714e+005 kg·mm ²	1.68e+007 kg·mm ²	1.5457e+007 kg·mm ²	1.2459e+007 kg·mm ²	5.6821e+007 kg·mm ²
Moment of Inertia Ip2	4.4442e+005 kg·mm ²	34145 kg·mm ²	31455 kg·mm ²	29271 kg·mm ²	1.6143e+006 kg·mm ²
Moment of Inertia Ip3	43603 kg·mm ²	1.677e+007 kg·mm ²	1.543e+007 kg·mm ²	1.2434e+007 kg·mm ²	5.5221e+007 kg·mm ²
Statistics					
Nodes	440	296	272	2445	
Elements	179	24	22	926	

TABLE 4
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Geometry > Parts

Object Name	<i>Left Endplate Polyurethane</i>	<i>Right Endplate Downstream Hole area</i>	<i>Right Endplate Aluminum Casing</i>	<i>Right Endplate Polyurethane</i>	<i>Left Endplate Inner Steel slice</i>
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Polyurethane		Aluminum	Polyurethane	Stainless Steel
Stiffness Behavior	Flexible				
Nonlinear Material Effects	Yes				
Thickness					
Thickness Mode	Manual				
Bounding Box					
Length X	2327.6 mm	1998.1 mm	2338.8 mm	2322.8 mm	2294.9 mm
Length Y	3980.8 mm	3410. mm	4000.2 mm	3972.4 mm	3974.9 mm
Length Z	1956.7 mm	1457.6 mm	1984. mm	1954.5 mm	1983.2 mm
Properties					
Volume	3.4557e+007 mm ³	3.9784e+007 mm ³	1.1919e+007 mm ³	3.4764e+007 mm ³	2.9149e+006 mm ³
Mass	8.2936 kg	9.5482 kg	32.181 kg	8.3434 kg	23.319 kg
Centroid X	-1396. mm	1078.8 mm	1201.6 mm	1379.8 mm	
Centroid Y	2345.1 mm	1795.8 mm	2008.4 mm	2317.1 mm	
Centroid Z	542.67 mm	316.67 mm	651.27 mm	513.21 mm	
Moment of Inertia Ip1	2.0961e+007 kg·mm ²	1.321e+007 kg·mm ²	6.0236e+007 kg·mm ²	2.1346e+007 kg·mm ²	
Moment of Inertia Ip2	2.0417e+005 kg·mm ²	31513 kg·mm ²	1.6548e+006 kg·mm ²	1.8581e+005 kg·mm ²	
Moment of Inertia Ip3	2.076e+007 kg·mm ²	1.3183e+007 kg·mm ²	5.8594e+007 kg·mm ²	2.1163e+007 kg·mm ²	
Surface Area (approx.)					
	2.3908e+006 mm ²				
Statistics					
Nodes	1862	272	2379	1843	168
Elements	639	22	905	627	124

TABLE 5

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Geometry > Parts

Object Name	<i>Left Endplate Outer Steel slice</i>	<i>Right Endplate Outer Steel slice</i>	<i>Right Endplate Inner Steel Slice</i>	<i>Backplate Aluminum Casing</i>	<i>Backplate Polyurethane</i>
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Stainless Steel			Aluminum	Polyurethane
Nonlinear Material Effects	Yes				
Thickness	1.2192 mm				
Thickness Mode	Manual				
Stiffness Behavior				Flexible	
Bounding Box					
Length X	2294.9 mm	2294.8 mm		4682.7 mm	4659.3 mm
Length Y	3974.9 mm	3974.8 mm		186.53 mm	180.41 mm
Length Z	1983.2 mm	1984. mm		498.46 mm	476.92 mm
Properties					
Volume	2.9149e+006 mm ³			5.2863e+006 mm ³	1.1124e+008 mm ³
Mass	23.319 kg			14.273 kg	26.698 kg
Surface Area (approx.)	2.3908e+006 mm ²				
Centroid X				175.74 mm	-0.24556 mm
Centroid Y				3986.6 mm	3987.5 mm
Centroid Z				1225.6 mm	1222.4 mm
Moment of Inertia Ip1				7.8718e+005 kg·mm ²	5.1362e+005 kg·mm ²
Moment of Inertia Ip2				3.0219e+007 kg·mm ²	4.725e+007 kg·mm ²
Moment of Inertia Ip3				2.9438e+007 kg·mm ²	4.6748e+007 kg·mm ²
Statistics					
Nodes	176	157	155	708	241
Elements	132	113	111	74	24

TABLE 6

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Geometry > Parts

Object Name	<i>Rod 4</i>	<i>Rod 5</i>	<i>Rod 6</i>	<i>Rod 1</i>	<i>Rod 2</i>
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Carbon fiber				
Stiffness Behavior	Flexible				
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 mm ³	6.3841e+005 mm ³	7.6532e+005 mm ³	1.3079e+005 mm ³	2.577e+005 mm ³
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·mm ²	221.97 kg·mm ²	266.09 kg·mm ²	45.457 kg·mm ²	89.595 kg·mm ²
Moment of Inertia Ip2	1.6387e+005 kg·mm ²	3.1853e+005 kg·mm ²	5.4867e+005 kg·mm ²	2768.1 kg·mm ²	21001 kg·mm ²
Moment of Inertia Ip3	1.6388e+005 kg·mm ²	3.1853e+005 kg·mm ²	5.4867e+005 kg·mm ²	2768.2 kg·mm ²	21001 kg·mm ²
Statistics					
Nodes	27520	34352	41184	11946	7788
Elements	3920	4896	5872	1760	1104

TABLE 7
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Geometry > Parts

Object Name	<i>Rod 3</i>	<i>Force ref line</i>	<i>30 deg Ref line</i>	<i>60 Deg Ref line</i>	<i>Left Hinge</i>
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Carbon fiber	Polyurethane			
Stiffness Behavior	Flexible				
Nonlinear Material Effects	Yes				
Bounding Box					
Length X	1975.8 mm	70. mm	11.116 mm	20.123 mm	250.37 mm
Length Y	50.8 mm	3.6786 mm	19.253 mm	11.618 mm	371.11 mm
Length Z	50.8 mm	5. mm			528.13 mm
Properties					
Volume	3.846e+005 mm ³	643.76 mm ³	535.05 mm ³	584.49 mm ³	2.9863e+007 mm ³
Mass	0.22307 kg	1.545e-004 kg	1.2841e-004 kg	1.4028e-004 kg	7.1671 kg
Centroid X	-5.8382e-011 mm	2.7078e-014 mm	-3.7053 mm	-6.7077 mm	-1527.6 mm
Centroid Y	1663.9 mm	68.426 mm	39.079 mm	13.673 mm	4131.5 mm
Centroid Z	669.03 mm	2.5 mm			1265.9 mm
Moment of Inertia Ip1	133.72 kg·mm ²	4.3804e-004 kg·mm ²	3.1967e-003 kg·mm ²	1.0045e-003 kg·mm ²	1.7368e+005 kg·mm ²
Moment of Inertia Ip2	69702 kg·mm ²	3.1866e-002 kg·mm ²	8.6441e-004 kg·mm ²	3.7877e-003 kg·mm ²	1.7368e+005 kg·mm ²
Moment of Inertia Ip3	69702 kg·mm ²	3.1661e-002	3.526e-003	4.2077e-003	74658 kg·mm ²

		kg·mm ²	kg·mm ²	kg·mm ²	
Statistics					
Nodes	20576	237	294	250	376
Elements	2928	22	38	30	54

TABLE 8
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Geometry > Parts

Object Name	<i>Right Hinge</i>	<i>Backplate Outer steel slice</i>	<i>Back Plate Inner Steel slice</i>
State	Meshed	Hidden	
Graphics Properties			
Visible	Yes	No	
Transparency	1		
Definition			
Suppressed	No		
Material	Polyurethane	Stainless Steel	
Stiffness Behavior	Flexible		
Nonlinear Material Effects	Yes		
Thickness		1.2192 mm	
Thickness Mode		Manual	
Bounding Box			
Length X	250.37 mm	4524.4 mm	
Length Y	371.11 mm	137.65 mm	
Length Z	528.13 mm	484.52 mm	
Properties			
Volume	2.9863e+007 mm ³	2.7483e+006 mm ³	
Mass	7.1671 kg	21.987 kg	
Centroid X	1521.8 mm		
Centroid Y	4132.1 mm		
Centroid Z	1263.7 mm		
Moment of Inertia Ip1	1.7368e+005 kg·mm ²		
Moment of Inertia Ip2	1.7368e+005 kg·mm ²		
Moment of Inertia Ip3	74658 kg·mm ²		
Surface Area(approx.)		2.2542e+006 mm ²	
Statistics			
Nodes	376	174	186
Elements	54	129	141

Connections

TABLE 9
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections

Object Name	<i>Connections</i>
State	Fully Defined
Auto Detection	
Generate Contact On Update	Yes
Tolerance Type	Slider
Tolerance Slider	0.
Tolerance Value	16.886 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 10

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections > Contact Regions

Object Name	Contact Region	Contact Region 2	Contact Region 3	Contact Region 4	Contact Region 5
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	2 Faces				1 Face
Target	2 Faces				1 Face
Contact Bodies	Nose Plate				
Target Bodies	Left Endplate Aluminum Casing	Left Endplate Polyurethane	Right Endplate Aluminum Casing	Right Endplate Polyurethane	Left 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 11

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > 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			4 Faces	
Target	1 Face			4 Faces	
Contact Bodies	Nose Plate			Left Endplate Downstream Hole area	
Target Bodies	Right Endplate Inner Steel Slice	Force ref line	30 deg Ref line	60 Deg Ref line	Left Endplate Polyurethane
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 12

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections > Contact Regions

Object Name	<i>Contact Region 11</i>	<i>Contact Region 12</i>	<i>Contact Region 13</i>	<i>Contact Region 14</i>	<i>Contact Region 15</i>
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face		4 Faces		1 Face
Target	1 Face		4 Faces		1 Face
Contact Bodies	Left Endplate Downstream Hole area		Right Endplate Upstream Hole area		
Target Bodies	Left Endplate Inner Steel slice	Left Endplate Outer Steel slice	Right Endplate Aluminum Casing	Right Endplate Polyurethane	Right 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 13

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections > Contact Regions

Object Name	<i>Contact Region 16</i>	<i>Contact Region 17</i>	<i>Contact Region 18</i>	<i>Contact Region 19</i>	<i>Contact Region 20</i>
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face		4 Faces		1 Face
Target	1 Face		4 Faces		1 Face
Contact Bodies	Right Endplate Upstream Hole area	Left Endplate Upstream Hole area			
Target Bodies	Right Endplate Inner Steel Slice	Left Endplate Aluminum Casing	Left Endplate Polyurethane	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 14

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections > Contact Regions

Object Name	<i>Contact Region 21</i>	<i>Contact Region 22</i>	<i>Contact Region 23</i>	<i>Contact Region 24</i>	<i>Contact Region 25</i>
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	4 Faces	1 Face			
Target	4 Faces	1 Face			
Contact Bodies	Left Endplate Aluminum Casing				
Target Bodies	Left Endplate Polyurethane	Left Endplate Inner Steel slice	Left Endplate Outer Steel slice	Rod 4	Rod 5
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

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections > Contact Regions

Object Name	<i>Contact Region 26</i>	<i>Contact Region 27</i>	<i>Contact Region 28</i>	<i>Contact Region 29</i>	<i>Contact Region 30</i>
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Left Endplate Aluminum Casing				Left Endplate Polyurethane
Target Bodies	Rod 6	Rod 1	Rod 2	Rod 3	Left 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 16

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > 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	1 Face	4 Faces	1 Face	4 Faces	
Target	1 Face	4 Faces	1 Face	4 Faces	
Contact Bodies	Left Endplate Polyurethane	Right Endplate Downstream Hole area			Right Endplate Aluminum Casing
Target Bodies	Left Endplate Outer Steel slice	Right Endplate Polyurethane	Right Endplate Outer Steel slice	Right Endplate Inner Steel Slice	Right Endplate Polyurethane
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

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections > Contact Regions

Object Name	Contact Region 36	Contact Region 37	Contact Region 38	Contact Region 39	Contact Region 40
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Right Endplate Aluminum Casing				
Target Bodies	Right Endplate Outer Steel slice	Right Endplate Inner Steel Slice	Rod 4	Rod 5	Rod 6
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

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections > Contact Regions

Object Name	Contact Region 41	Contact Region 42	Contact Region 43	Contact Region 44	Contact Region 45
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Right Endplate Aluminum Casing			Right Endplate Polyurethane	
Target Bodies	Rod 1	Rod 2	Rod 3	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 19

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections > Contact Regions

Object Name	Contact Region 46	Contact Region 47	Contact Region 48	Contact Region 49	Contact Region 50
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	4 Faces	2 Faces		1 Face	
Target	4 Faces	2 Faces		1 Face	
Contact Bodies	Backplate Aluminum Casing			Backplate Polyurethane	
Target Bodies	Backplate Polyurethane	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 20

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections > Contact Regions

Object Name	<i>Contact Region 51</i>	<i>Contact Region 52</i>	<i>Contact Region 53</i>	<i>Contact Region 54</i>	<i>Contact Region 55</i>
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Backplate Aluminum Casing		Backplate Polyurethane		Left Hinge
Target Bodies	Backplate Outer steel slice	Back Plate Inner Steel slice	Backplate Outer steel slice	Back Plate 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 21

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections > Contact Regions

Object Name	<i>Contact Region 56</i>	<i>Bonded - Backplate Aluminum Casing To Left Endplate Aluminum Casing</i>	<i>Bonded - Backplate Aluminum Casing To Right Endplate Aluminum Casing</i>	<i>No Separation - Backplate Outer steel slice To Backplate Polyurethane</i>	<i>No Separation - Back Plate Inner Steel slice To Backplate Polyurethane</i>
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face	1 Edge		1 Face	
Target	1 Face	1 Edge		1 Face	
Contact Bodies	Right Hinge	Backplate Aluminum Casing		Backplate Outer steel slice	Back Plate Inner Steel slice
Target Bodies	Backplate Outer steel slice	Left Endplate Aluminum Casing	Right Endplate Aluminum Casing	Backplate Polyurethane	
Definition					
Type	Bonded			No Separation	

Scope Mode	Automatic	Manual
Behavior	Symmetric	Symmetric
Suppressed	No	
Advanced		
Formulation	Pure Penalty	
Normal Stiffness	Program Controlled	
Update Stiffness	Never	
Thermal Conductance	Program Controlled	
Pinball Region	Program Controlled	Radius
Pinball Radius		50. mm

TABLE 22

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Connections > Contact Regions

Object Name	<i>Bonded - Left Endplate Aluminum Casing To Backplate Outer steel slice</i>	<i>Bonded - Left Endplate Aluminum Casing To Back Plate Inner Steel slice</i>	<i>Weld - Backplate Aluminum Casing To Backplate Outer steel slice</i>	<i>Weld - Backplate Aluminum Casing To Back Plate Inner Steel slice</i>
State	Fully Defined			
Scope				
Scoping Method	Geometry Selection			
Contact	1 Edge		1 Vertex	
Target	1 Edge		1 Vertex	
Contact Bodies	Left Endplate Aluminum Casing		Backplate Aluminum Casing	
Target Bodies	Backplate Outer steel slice	Back Plate Inner Steel slice	Backplate Outer steel slice	Back Plate Inner Steel slice
Definition				
Type	Bonded			
Scope Mode	Manual			
Suppressed	No			
Advanced				
Formulation	Pure Penalty			
Normal Stiffness	Program Controlled			
Update Stiffness	Never			
Thermal Conductance	Program Controlled			
Pinball Region	Radius			
Pinball Radius	200. mm			

Mesh

TABLE 23

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Mesh

Object Name	<i>Mesh</i>
State	Solved

Defaults	
Physics Preference	Mechanical
Relevance	-35
Advanced	
Relevance Center	Coarse
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	156969
Elements	24894

Static Structural

TABLE 24
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Analysis

Object Name	<i>Static Structural</i>
State	Fully Defined
Definition	
Physics Type	Structural
Analysis Type	Static Structural
Options	
Reference Temp	22. °C

TABLE 25
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Analysis Settings

Object Name	<i>Analysis Settings</i>
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	Program Controlled
Large Deflection	Off
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\AI slit\New Constraints\Analysis 2 \Analysis2 Simulation Files\Static Structural\
Future Analysis	None
Save ANSYS db	No
Delete Unneeded Files	Yes
Nonlinear Solution	No

FIGURE 1

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Figure

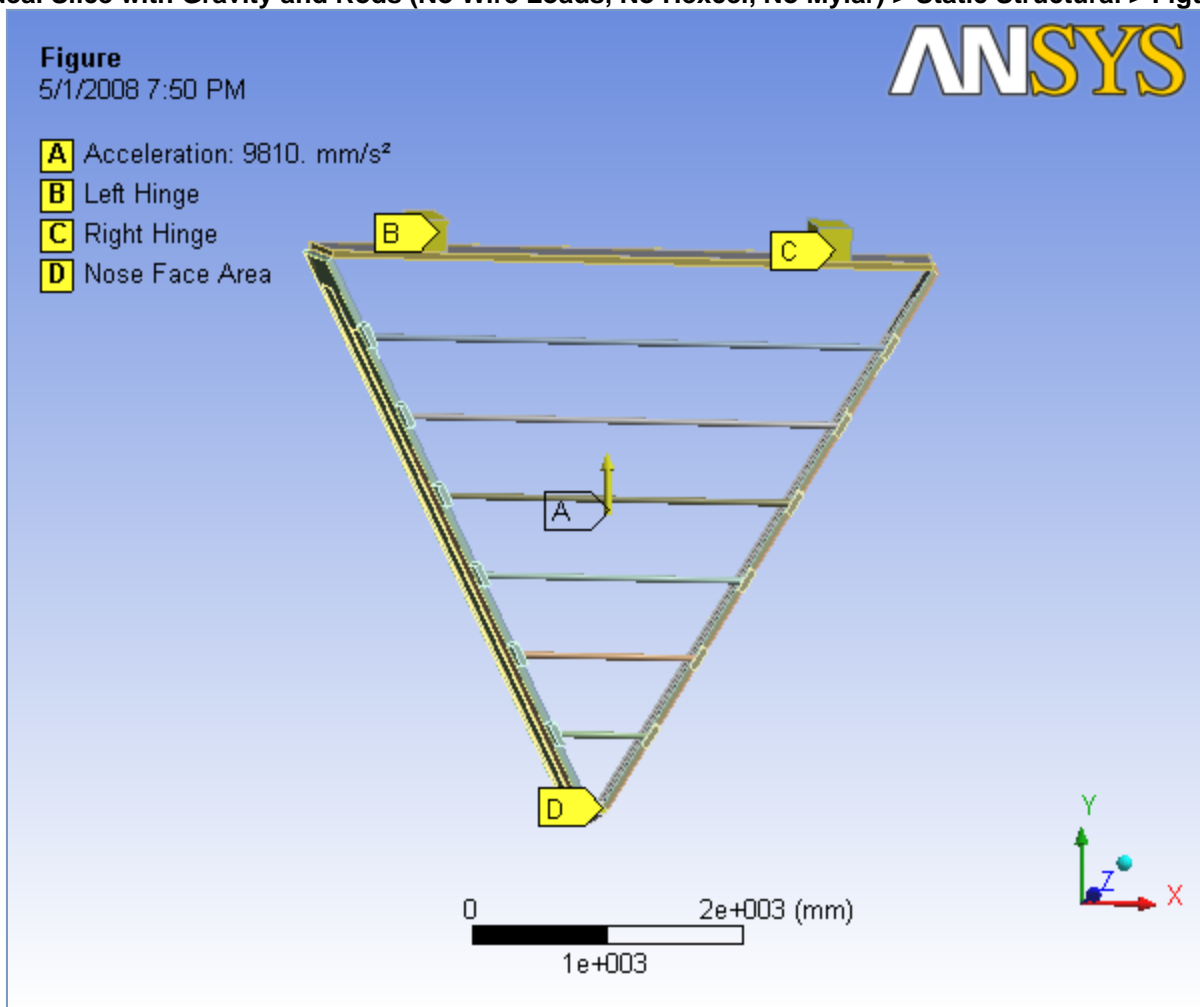


TABLE 26

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Accelerations

Object Name	Acceleration
State	Fully Defined
Scope	

Geometry	All Bodies
Definition	
Define By	Vector
Magnitude	9810. mm/s ² (ramped)
Direction	Defined
Suppressed	No

FIGURE 2

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Acceleration

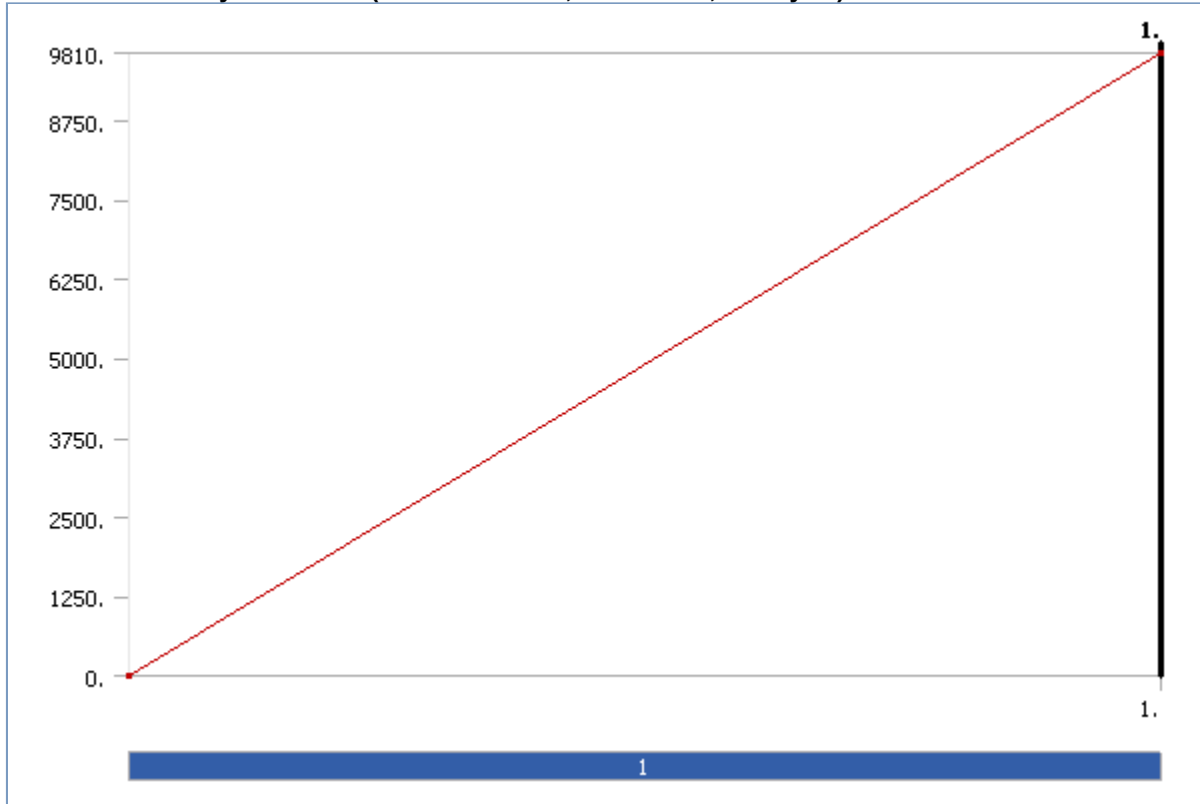


TABLE 27

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Loads

Object Name	<i>Right Upstream</i>	<i>Right Downstream</i>	<i>Left Upstream</i>	<i>Left Downstream</i>	<i>Left Hinge</i>
State	Suppressed				Fully Defined
Scope					
Scoping Method	Geometry Selection				
Geometry	1 Face				5 Faces
Definition					
Define By	Vector				Components
Type	Force				Displacement
Magnitude	1512. N (ramped)				
Direction	Defined				
Suppressed	Yes				No
X Component					Free
Y Component					0. mm (ramped)
Z Component					0. mm (ramped)

FIGURE 3

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Right

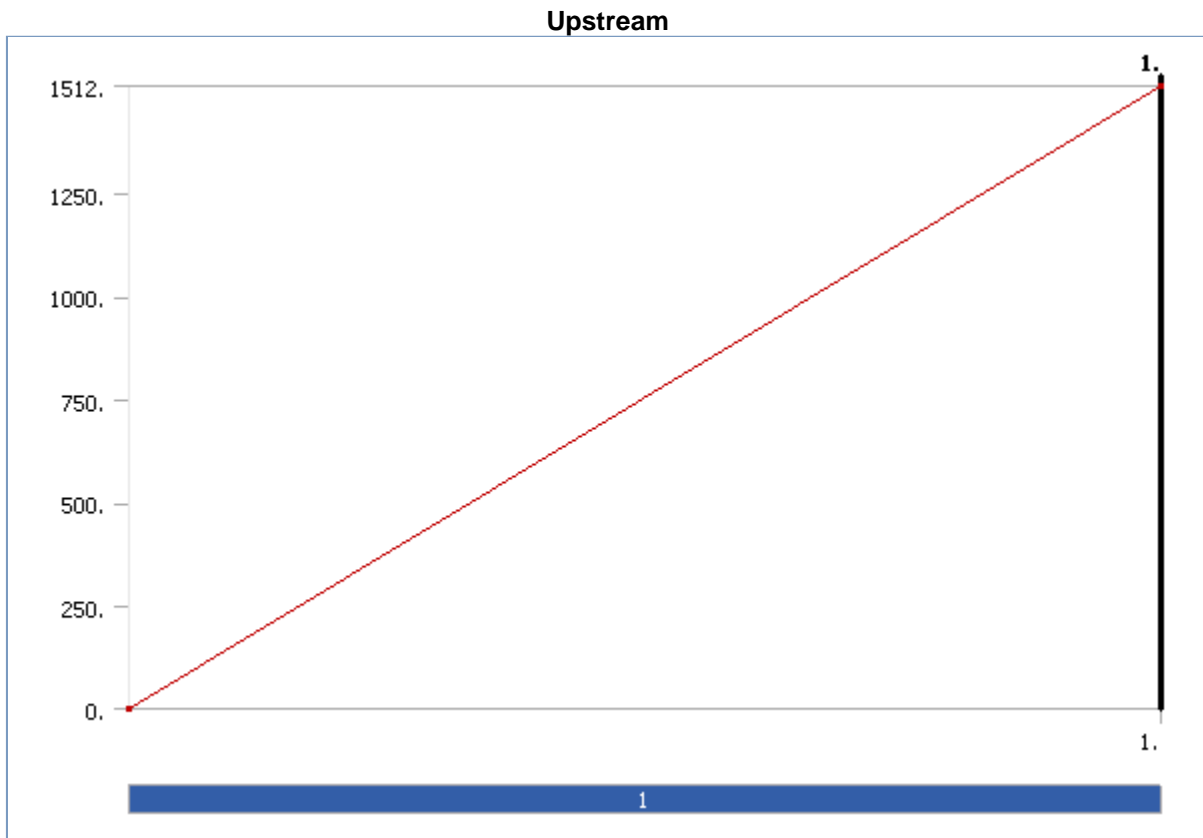


FIGURE 4
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Right
Downstream

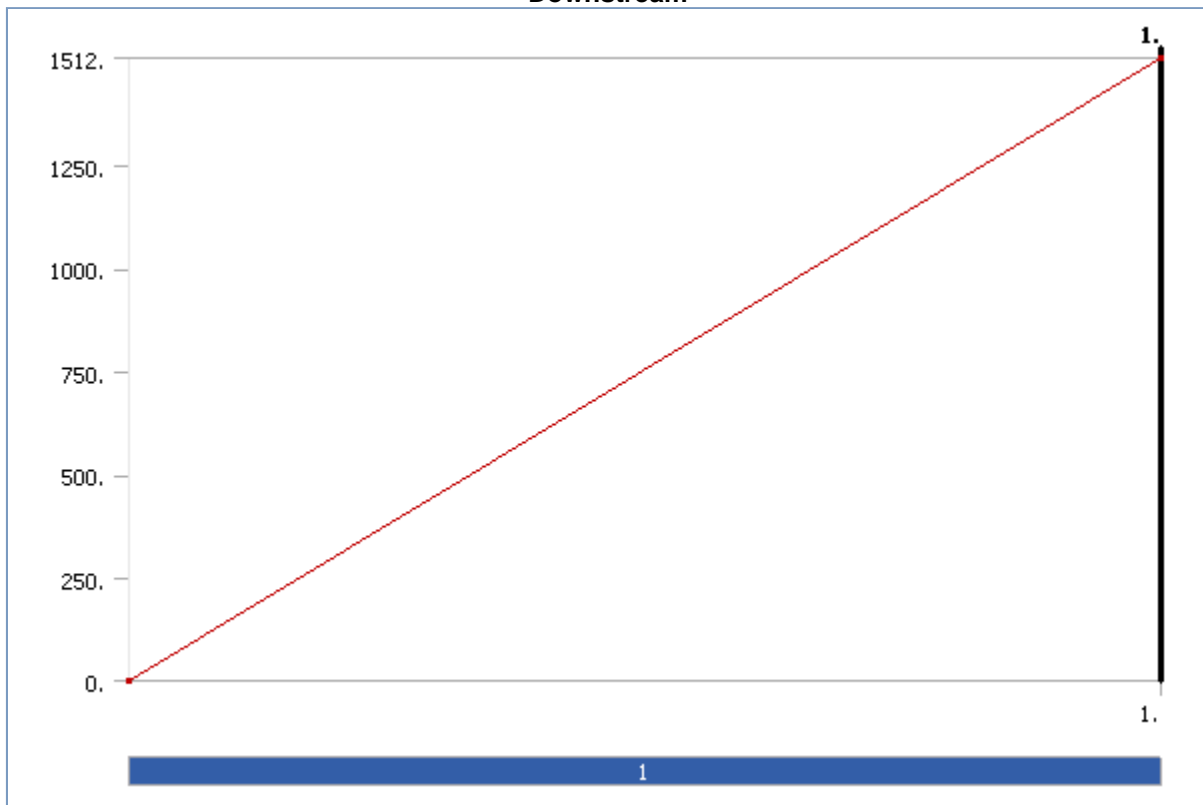


FIGURE 5
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Left Upstream

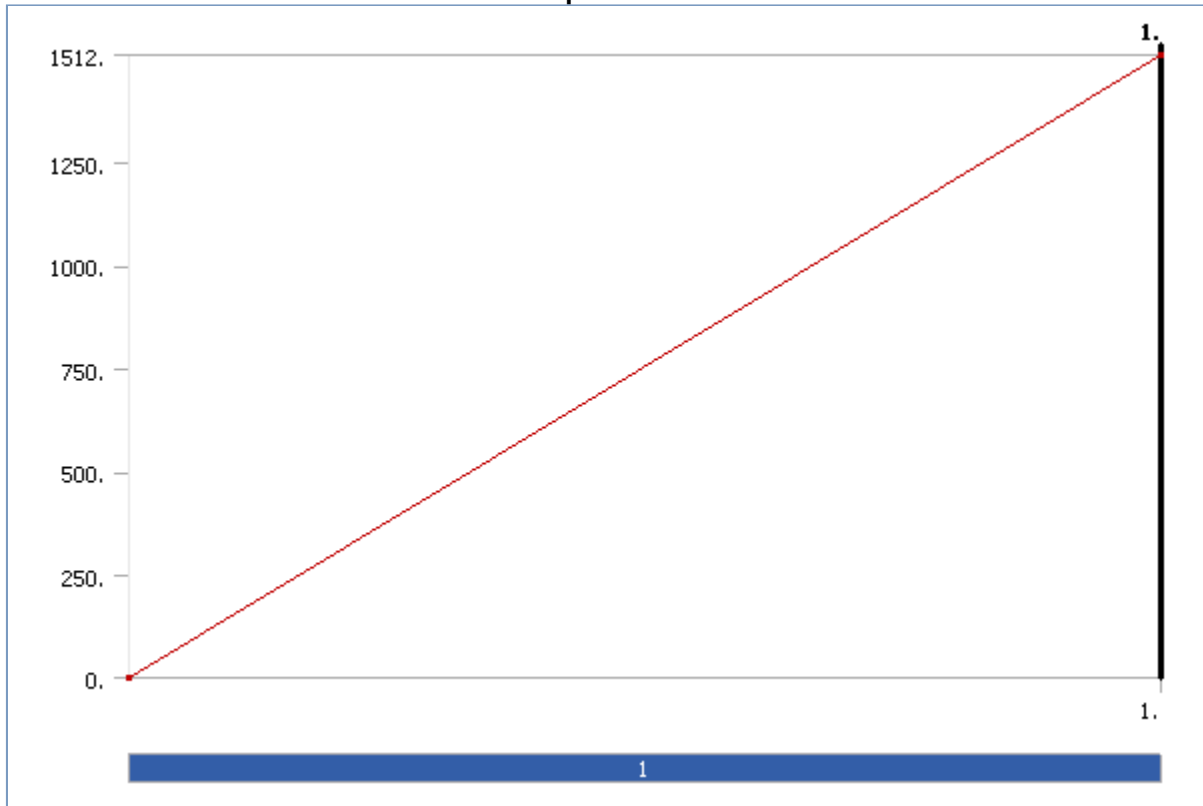


FIGURE 6
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Left Downstream

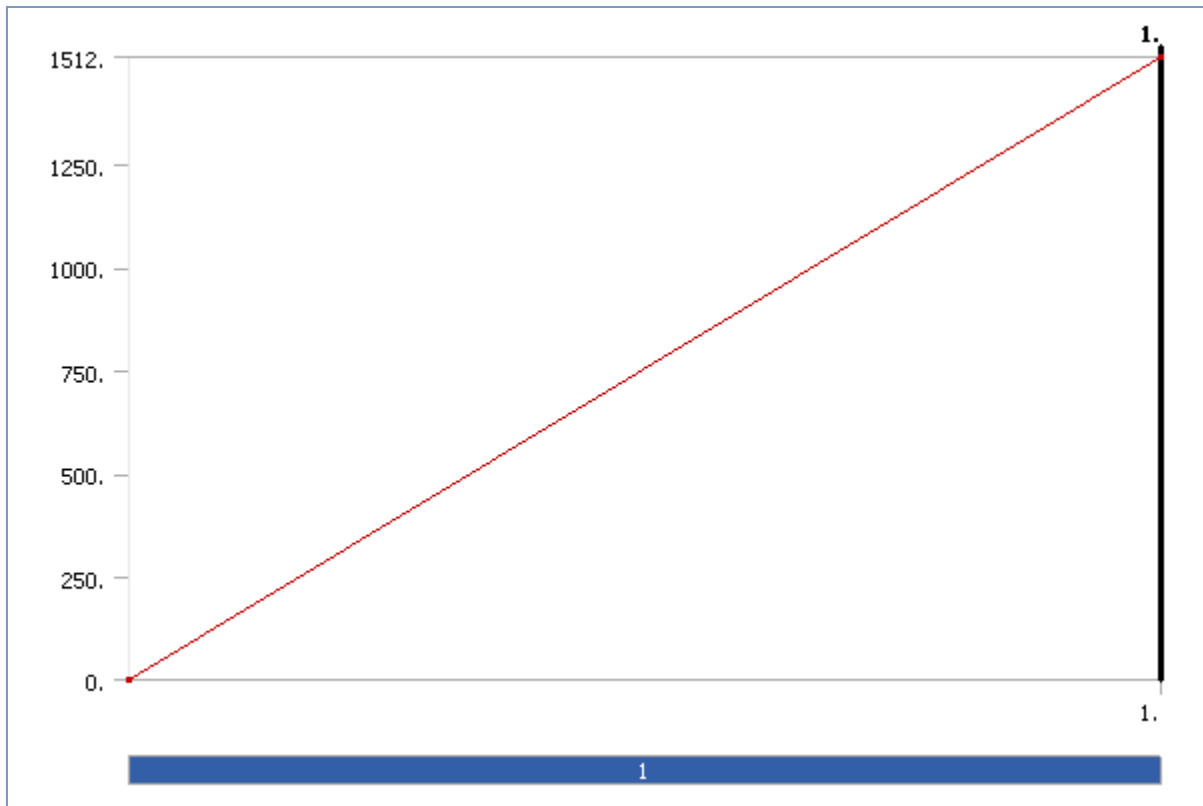


FIGURE 7

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Left Hinge

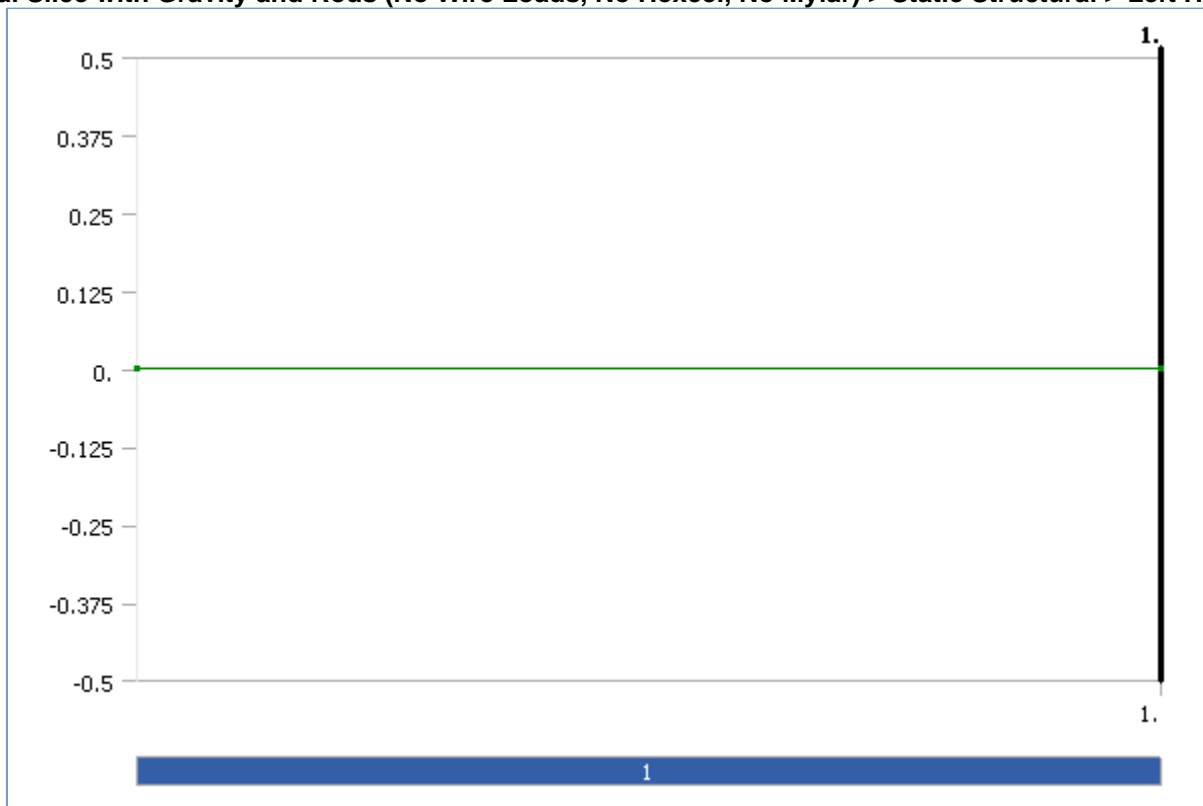


TABLE 28

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Loads

Object Name	<i>Right Hinge</i>	<i>Nose Face Area</i>
State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Geometry	5 Faces	1 Face
Definition		
Define By	Components	
Type	Displacement	
X Component	0. mm (ramped)	
Y Component	Free	
Z Component	0. mm (ramped)	
Suppressed	No	

FIGURE 8

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Right Hinge

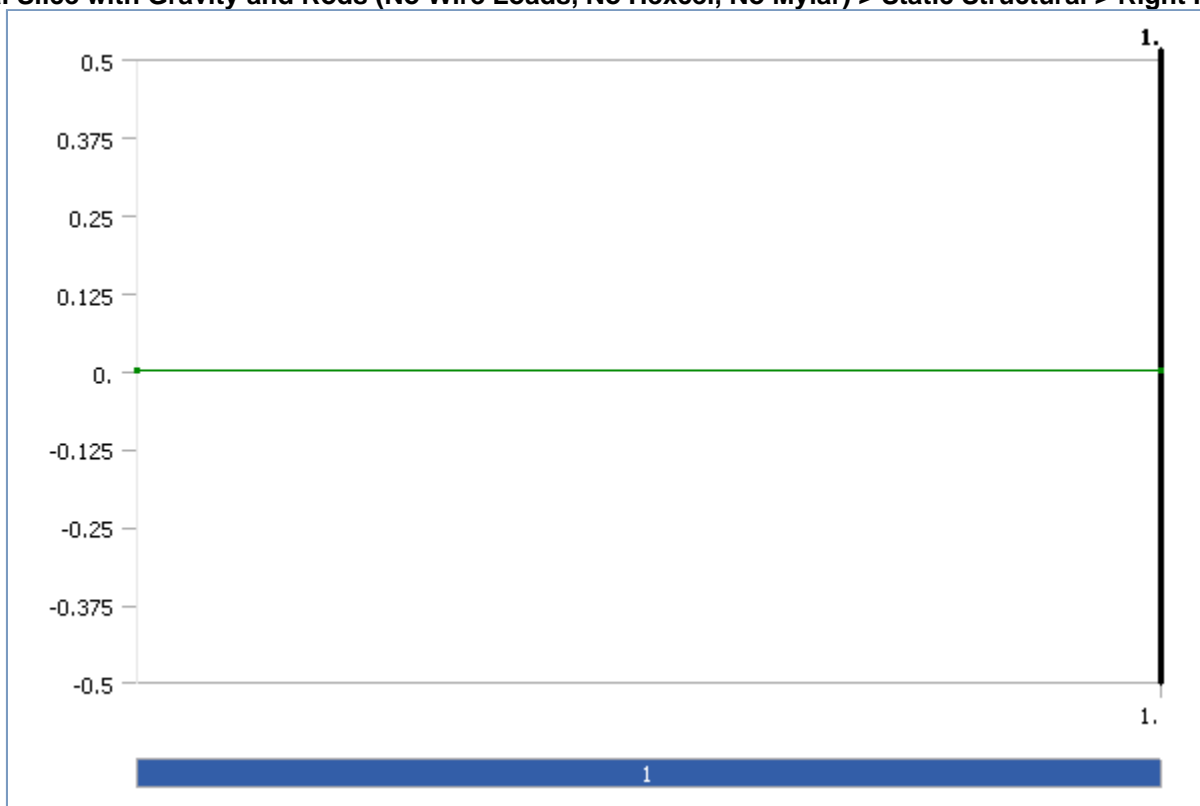
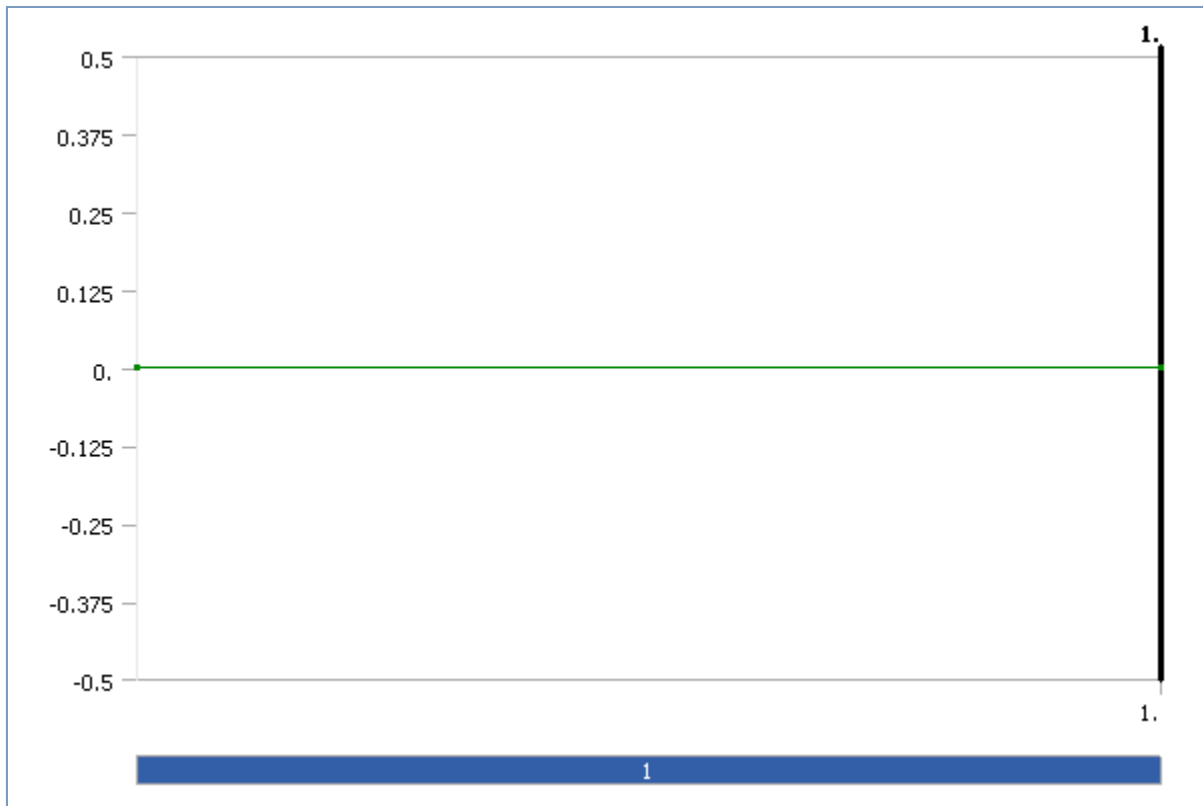


FIGURE 9

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Nose Face Area



Solution

TABLE 29
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Solution

Object Name	<i>Solution</i>
State	Solved
Adaptive Mesh Refinement	
Max Refinement Loops	1.
Refinement Depth	2.

TABLE 30
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Solution > Solution Information

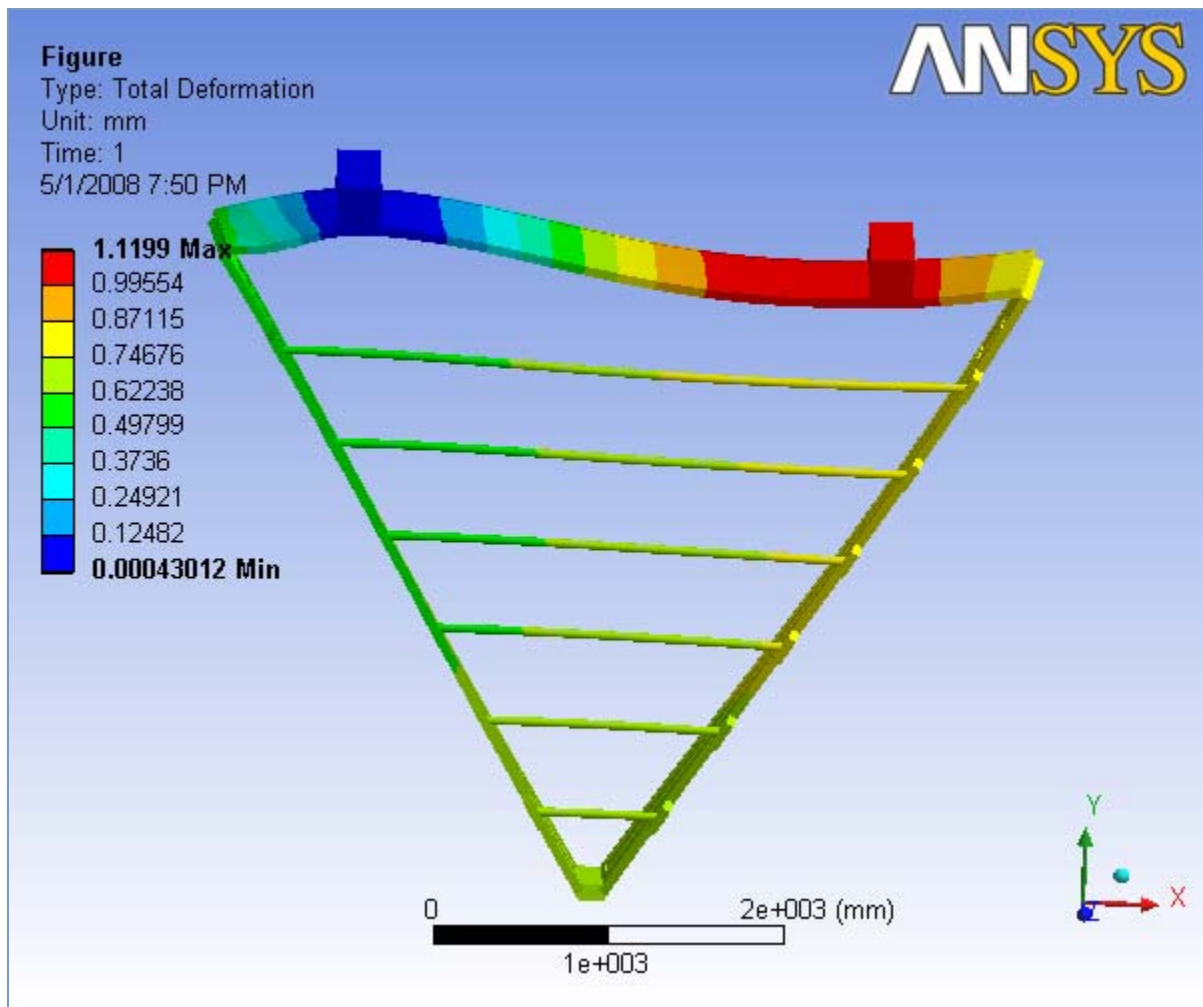
Object Name	<i>Solution Information</i>
State	Solved
Solution Information	
Solution Output	Solver Output
Newton-Raphson Residuals	0
Update Interval	2.5 s
Display Points	All

TABLE 31
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Solution > Results

Object Name	<i>Total Deformation</i>	<i>X Deformation</i>	<i>Y Deformation</i>	<i>Z Deformation</i>	<i>Equivalent Stress</i>
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	4.3012e-004 mm	-2.9511e-002 mm	-1.1191 mm	-0.21168 mm	1.2935e-005 MPa
Maximum	1.1199 mm	0.20838 mm	2.9693e-002 mm	0.12563 mm	22.794 MPa
Minimum Occurs On	Left Hinge	Back Plate Inner Steel slice		Left Endplate Aluminum Casing	60 Deg Ref line
Maximum Occurs On	Back Plate Inner Steel slice	Right Endplate Inner Steel Slice	Left Hinge	Right Endplate Aluminum Casing	Backplate Outer steel slice
Information					
Time	1. s				
Load Step	1				
Substep	1				
Iteration Number	1				

FIGURE 10
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Solution > Total Deformation > Figure

**FIGURE 11**

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Solution > X Deformation > Figure

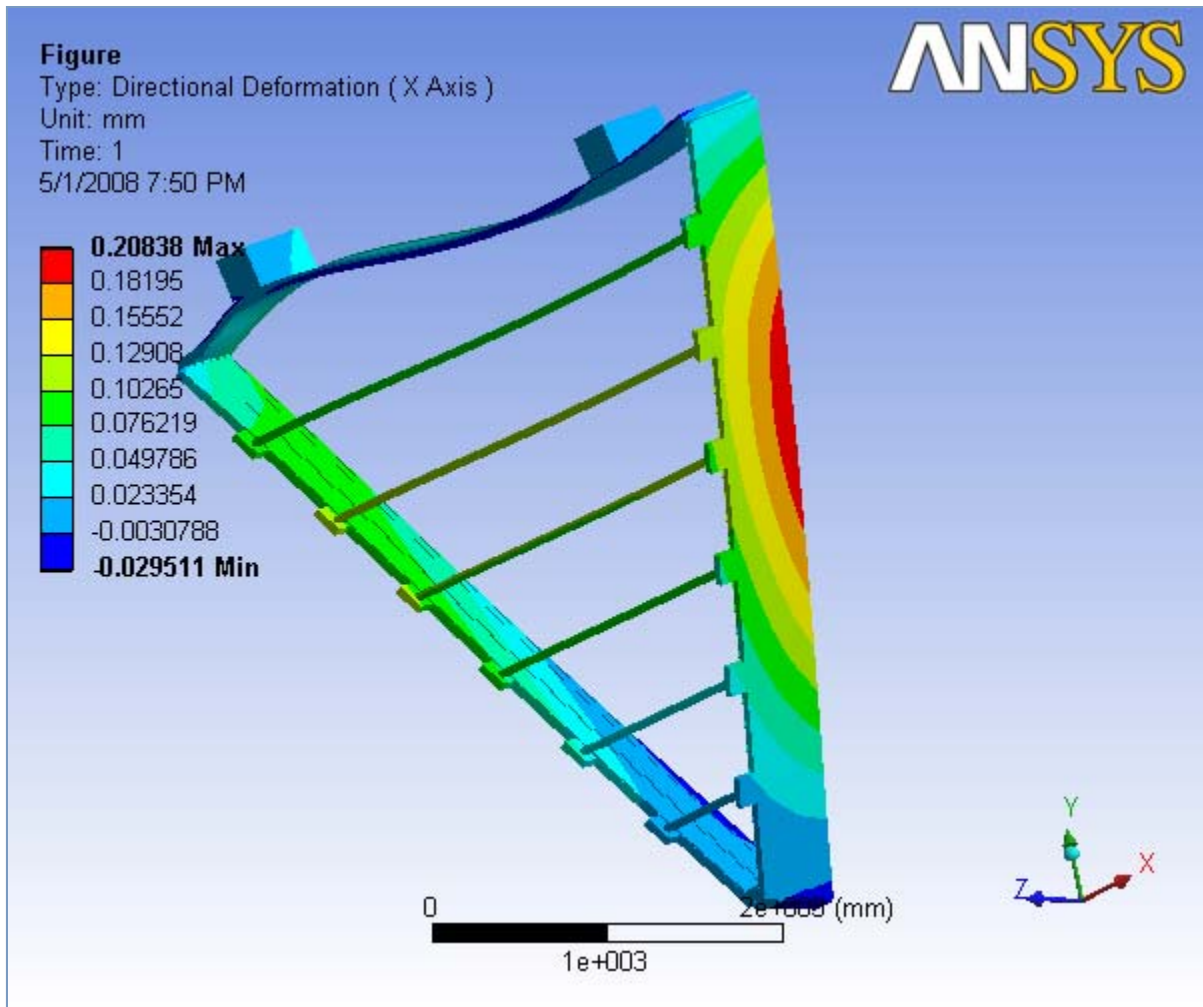
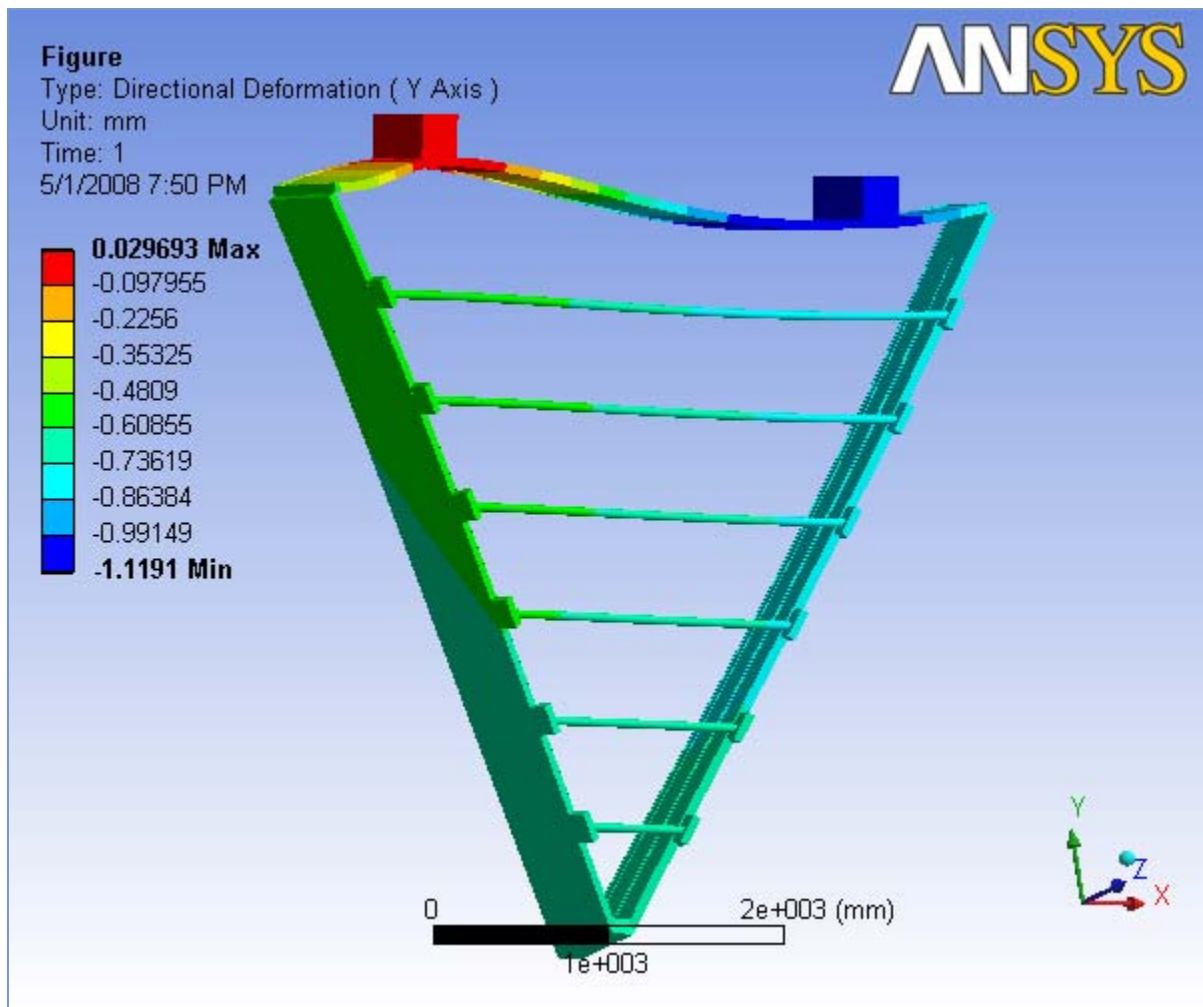


FIGURE 12

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Solution > Y Deformation > Figure

**FIGURE 13**

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Solution > Z Deformation > Figure

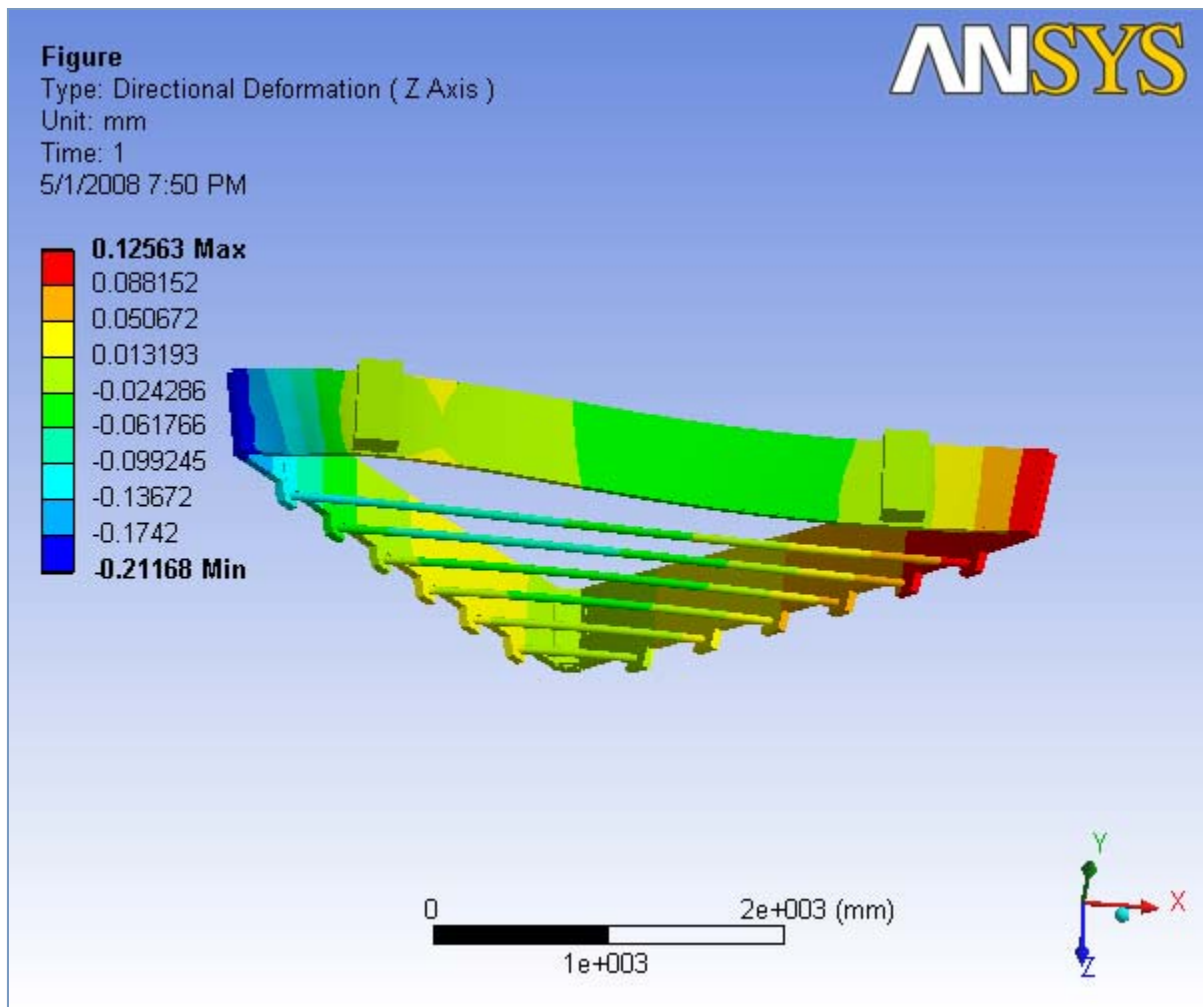


FIGURE 14
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Solution > Equivalent Stress > Figure

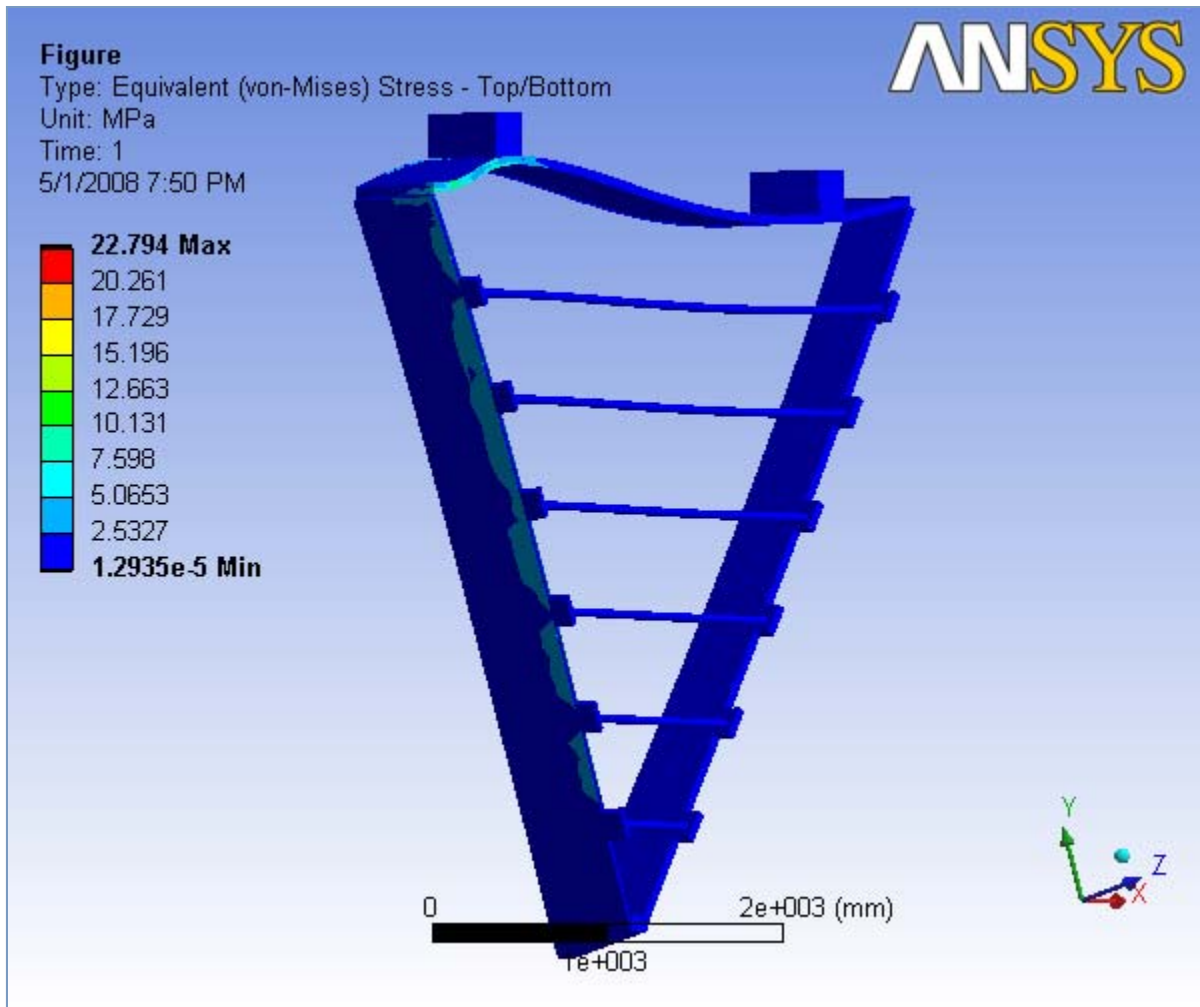
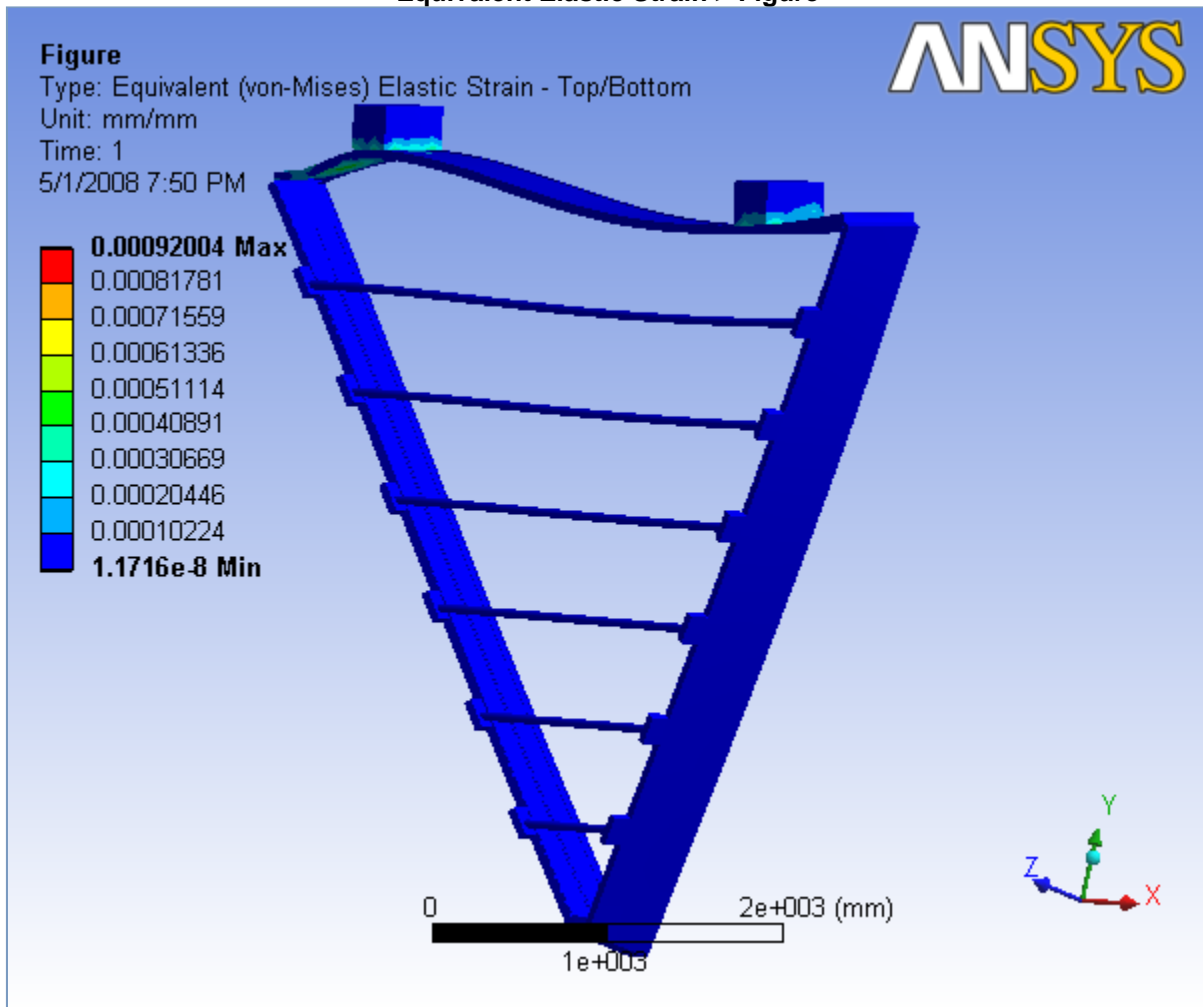


TABLE 32

Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Solution > Results

Object Name	<i>Equivalent Elastic Strain</i>
State	Solved
Scope	
Geometry	All Bodies
Definition	
Type	Equivalent (von-Mises) Elastic Strain
Shell	Top/Bottom
Display Time	End Time
Results	
Minimum	1.1716e-008 mm/mm
Maximum	9.2004e-004 mm/mm
Minimum Occurs On	Right Endplate Aluminum Casing
Maximum Occurs On	Left Hinge
Information	
Time	1. s
Load Step	1
Substep	1
Iteration Number	1

FIGURE 15
Ideal Slice with Gravity and Rods (No Wire Loads, No Hexcel, No Mylar) > Static Structural > Solution > Equivalent Elastic Strain > Figure



Material Data

Aluminum

TABLE 33
Aluminum > Constants

Structural	
Young's Modulus	68900 MPa
Poisson's Ratio	0.33
Density	2.7e-006 kg/mm ³
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 34
Polyurethane > Constants

Structural	
Young's Modulus	66. MPa
Poisson's Ratio	0.3
Density	2.4e-007 kg/mm ³
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

Stainless Steel

TABLE 35
Stainless Steel > Constants

Structural	
Young's Modulus	1.93e+005 MPa
Poisson's Ratio	0.3
Density	8.e-006 kg/mm ³
Thermal Expansion	0. 1/°C
Thermal	
Thermal Conductivity	1.63e-002 W/mm·°C
Specific Heat	500. J/kg·°C
Electromagnetics	
Relative Permeability	0.
Resistivity	0. Ohm-mm

Carbon fiber

TABLE 36
Carbon fiber > Constants

Structural	
Young's Modulus	1.5e+005 MPa
Poisson's Ratio	0.3
Density	5.8e-007 kg/mm ³
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