Analysis of sector 1 with rear triangular constraints and 2 face constraint on nose plate

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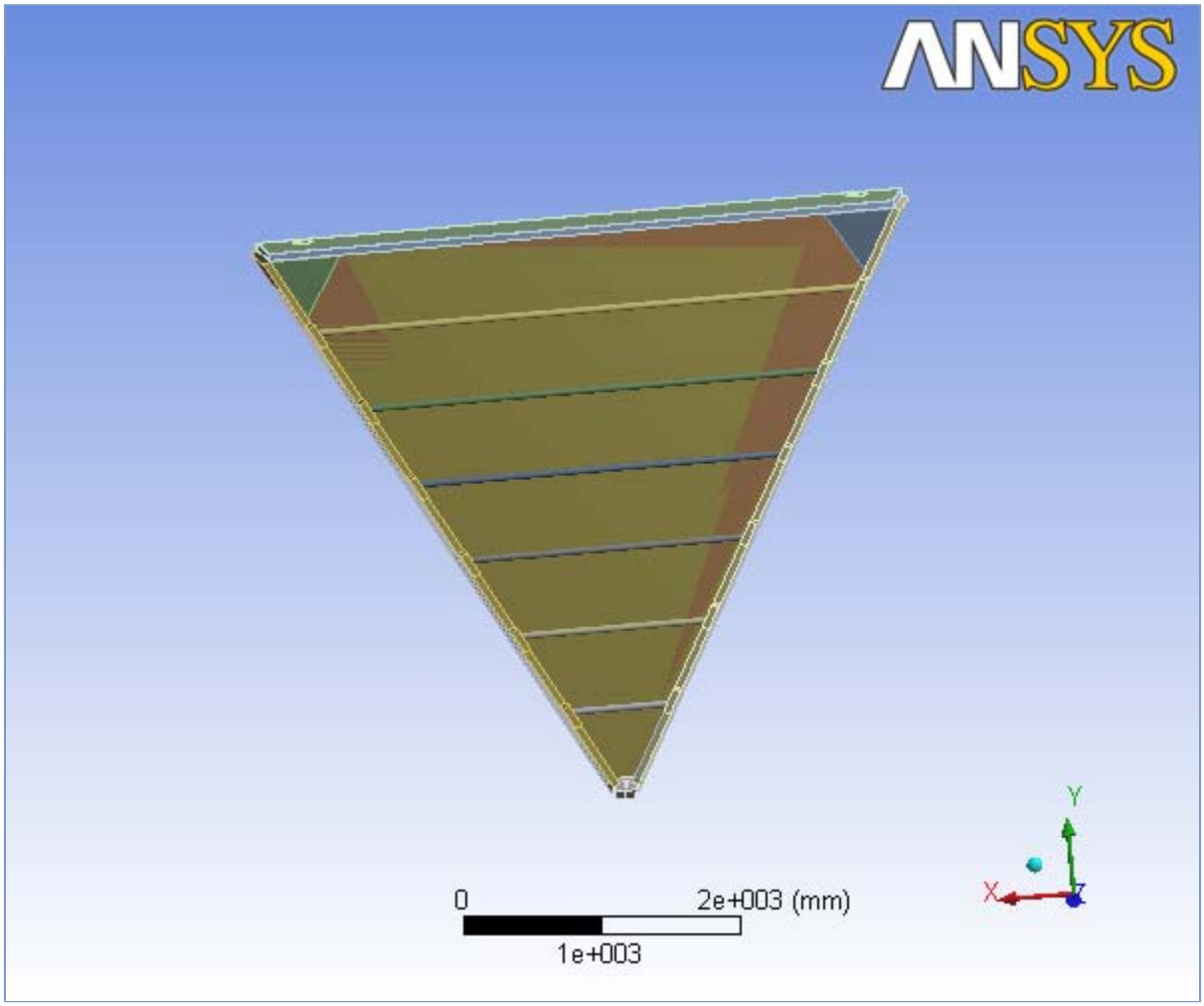

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  - Aluminum
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Units

TABLE 1

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

sector 1, Case 2

Geometry

TABLE 2
sector 1, Case 2 > Geometry

Object Name	*Geometry*
State	Fully Defined
Definition	
Source	C:\Documents and Settings\Jinnuri\Desktop\website\Al slit\change of directions\2.agdb
Type	DesignModeler
Length Unit	Millimeters
Element Control	Program Controlled
Display Style	Part Color
Bounding Box	
Length X	4768.3 mm
Length Y	4080.2 mm

Length Z	2017.5 mm
Properties	
Volume	8.1982e+008 mm³
Mass	3375.9 kg
Statistics	
Bodies	47
Active Bodies	47
Nodes	248785
Elements	69752
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
sector 1, Case 2 > Geometry > Parts

Object Name	*Nose Plate*	*Right End Plate Upstream Hole Area*	*Right End Plate Downstream Hole Area*	*Right End Plate Aluminum Casing*	*Right End Plate Polyurethane*
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Aluminum	Polyurethane		Aluminum	Polyurethane
Stiffness Behavior	Flexible				
Nonlinear Material Effects	Yes				
Coordinate System	Global Coordinate System				
Bounding Box					
Length X	180.6 mm	2116.2 mm	1998.1 mm	2338.8 mm	2327.5 mm
Length Y	94.006 mm	3614.6 mm	3410. mm	4000.2 mm	3979.7 mm
Length Z	553. mm	1531.7 mm	1457.6 mm	2002.1 mm	1975.7 mm
Properties					

Volume	6.886e+006 mm³	4.1332e+007 mm³	3.9784e+007 mm³	1.1327e+007 mm³	3.9428e+007 mm³
Mass	18.592 kg	9.9198 kg	9.5482 kg	30.582 kg	9.4627 kg
Centroid X	-3.2446e-015 mm	-1131.3 mm	-1075.8 mm	-1179.7 mm	-1378.7 mm
Centroid Y	42.66 mm	1886.7 mm	1790.6 mm	1970.6 mm	2315.2 mm
Centroid Z	-276.75 mm	-1096.2 mm	-833.09 mm	-1180.9 mm	-1106.5 mm
Moment of Inertia Ip1	4.7706e+005 kg·mm²	1.5457e+007 kg·mm²	1.321e+007 kg·mm²	5.6156e+007 kg·mm²	2.3251e+007 kg·mm²
Moment of Inertia Ip2	4.9498e+005 kg·mm²	31455 kg·mm²	31512 kg·mm²	1.6933e+006 kg·mm²	3.1613e+005 kg·mm²
Moment of Inertia Ip3	45266 kg·mm²	1.543e+007 kg·mm²	1.3183e+007 kg·mm²	5.4466e+007 kg·mm²	2.2926e+007 kg·mm²
Statistics					
Nodes	826	2982	2626	2281	13010
Elements	375	1346	1180	900	6058

TABLE 4
sector 1, Case 2 > Geometry > Parts

Object Name	*Right End Plate Inner Steel Slice*	*Right End Plate Outer Steel Slice*	*Left End Plate Downstream Hole Area*	*Left End Plate Upstream Hole Area*	*Left End Plate Aluminum Casing*
State	Hidden		Meshed		
Graphics Properties					
Visible	No		Yes		
Transparency			1		
Definition					
Suppressed	No				
Material	Stainless steel		Polyurethane		Aluminum
Nonlinear Material Effects	Yes				
Coordinate System	Global Coordinate System				
Thickness	1.2192 mm				
Thickness Mode	Manual				
Stiffness Behavior			Flexible		
Bounding Box					
Length X	165.4 mm	2294.8 mm	2159.8 mm	1973.8 mm	2338.9 mm
Length Y	286.49 mm	3974.8 mm	3690. mm	3368. mm	4000.3 mm
Length Z	108.8 mm	2002.1 mm	1562.8 mm	1437.5 mm	2001.3 mm
Properties					
Volume	63.217 mm³	3.0232e+006 mm³	4.3107e+007 mm³	3.8462e+007 mm³	1.1684e+007 mm³
Mass	5.0573e-004 kg	24.186 kg	10.346 kg	9.2309 kg	31.547 kg
Surface Area (approx.)	51.851 mm²	2.4797e+006 mm²			
Centroid X			1151.6 mm	1051. mm	1175.7 mm
Centroid Y			1921.8 mm	1747.7 mm	1963.6 mm
Centroid Z			-903.44 mm	-1064.2 mm	-1182.7 mm
Moment of Inertia Ip1			1.68e+007 kg·mm²	1.2459e+007 kg·mm²	5.6765e+007 kg·mm²

Moment of Inertia Ip2			34146 kg·mm²	29271 kg·mm²	1.765e+006 kg·mm²
Moment of Inertia Ip3			1.677e+007 kg·mm²	1.2434e+007 kg·mm²	5.5152e+007 kg·mm²
Statistics					
Nodes	15	169	3258	2861	2044
Elements	8	125	1508	1309	774

TABLE 5
sector 1, Case 2 > Geometry > Parts

Object Name	*Left End Plate Polyurethane*	*Left End Plate Outer Steel Slice*	*Left End Plate Inner Steel Slice*	*Back Plate Aluminum Casing*	*Back Plate Polyurethane*
State	Meshed	Hidden		Meshed	
Graphics Properties					
Visible	Yes	No		Yes	
Transparency	1			1	
Definition					
Suppressed	No				
Material	Polyurethane	Stainless steel		Aluminum	Polyurethane
Stiffness Behavior	Flexible			Flexible	
Nonlinear Material Effects	Yes				
Coordinate System	Global Coordinate System				
Thickness		1.2192 mm			
Thickness Mode		Manual			
Bounding Box					
Length X	2327.6 mm	2294.9 mm		4684.5 mm	4661.1 mm
Length Y	3980. mm	3974.9 mm		190.46 mm	184.99 mm
Length Z	1974.8 mm	2001.3 mm		512.91 mm	493.47 mm
Properties					
Volume	3.8974e+007 mm³	3.0232e+006 mm³	2.9943e+006 mm³	5.0618e+006 mm³	1.1561e+008 mm³
Mass	9.3538 kg	24.186 kg	23.954 kg	13.667 kg	27.746 kg
Centroid X	1381.8 mm			-0.98422 mm	-3.2054 mm
Centroid Y	2320.6 mm			3984.9 mm	3985.3 mm
Centroid Z	-1081.6 mm			-1763.4 mm	-1760.3 mm
Moment of Inertia Ip1	2.2788e+007 kg·mm²			8.2266e+005 kg·mm²	5.7406e+005 kg·mm²
Moment of Inertia Ip2	2.7595e+005 kg·mm²			2.897e+007 kg·mm²	4.9068e+007 kg·mm²
Moment of Inertia Ip3	2.2504e+007 kg·mm²			2.8153e+007 kg·mm²	4.8506e+007 kg·mm²
Surface Area (approx.)		2.4797e+006 mm²	2.4559e+006 mm²		
Statistics					
Nodes	16473	153	187	3150	22172
Elements	7509	108	139	1436	12150

TABLE 6
sector 1, Case 2 > Geometry > Parts

	Back Plate Inner	*Back Plate Outer*			

Object Name	*Steel Slice*	*Steel Slice*	*Rod 6*	*Rod 1*	*Rod 2*
State	Hidden		Meshed		
Graphics Properties					
Visible	No		Yes		
Transparency			1		
Definition					
Suppressed	No				
Material	Stainless steel		Carbon fiber		
Nonlinear Material Effects	Yes				
Coordinate System	Global Coordinate System				
Thickness	1.2192 mm				
Thickness Mode	Manual				
Stiffness Behavior			Flexible		
Bounding Box					
Length X	4684.5 mm		3929.6 mm	718.26 mm	1360.5 mm
Length Y	141.59 mm		50.8 mm		
Length Z	499.04 mm		50.8 mm		
Properties					
Volume	2.8498e+006 mm³	2.9072e+006 mm³	7.7065e+005 mm³	1.3612e+005 mm³	2.6303e+005 mm³
Mass	22.799 kg	23.257 kg	0.44698 kg	7.8952e-002 kg	0.15256 kg
Surface Area (approx.)	2.3375e+006 mm²	2.3845e+006 mm²			
Centroid X			1.6823e-008 mm	-6.2387e-011 mm	1.3543e-009 mm
Centroid Y			3355.9 mm	575.17 mm	1131.1 mm
Centroid Z			-1861.8 mm	-805.33 mm	-1016.6 mm
Moment of Inertia Ip1			267.95 kg·mm²	47.312 kg·mm²	91.448 kg·mm²
Moment of Inertia Ip2			5.6021e+005 kg·mm²	3118.1 kg·mm²	22329 kg·mm²
Moment of Inertia Ip3			5.6021e+005 kg·mm²	3118.2 kg·mm²	22329 kg·mm²
Statistics					
Nodes	188	182	42080	13426	8292
Elements	140	137	6000	1980	1176

TABLE 7
sector 1, Case 2 > Geometry > Parts

Object Name	*Rod 3*	*Rod 4*	*Rod 5*	*Hexcel Outer Carbon Fiber Slice*	*Hexcel Inner Carbon Fiber Slice*
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Carbon fiber				
Stiffness Behavior	Flexible				

Nonlinear Material Effects	Yes				
Coordinate System	Global Coordinate System				
Thickness				0.254 mm	
Thickness Mode				Manual	
Bounding Box					
Length X	2002.8 mm	2645.1 mm	3287.3 mm	4114.9 mm	
Length Y	50.8 mm			3960.1 mm	3960.9 mm
Length Z	50.8 mm			1504.3 mm	1504.6 mm
Properties					
Volume	3.8993e+005 mm³	5.1684e+005 mm³	6.4374e+005 mm³	2.4943e+006 mm³	
Mass	0.22616 kg	0.29977 kg	0.37337 kg	1.4467 kg	
Centroid X	-3.6382e-010 mm	1.2733e-009 mm	-1.6018e-010 mm		
Centroid Y	1687.3 mm	2243.5 mm	2799.7 mm		
Centroid Z	-1227.9 mm	-1439.2 mm	-1650.5 mm		
Moment of Inertia Ip1	135.58 kg·mm²	179.71 kg·mm²	223.83 kg·mm²		
Moment of Inertia Ip2	72641 kg·mm²	1.6907e+005 kg·mm²	3.2659e+005 kg·mm²		
Moment of Inertia Ip3	72642 kg·mm²	1.6907e+005 kg·mm²	3.2659e+005 kg·mm²		
Surface Area (approx.)				9.82e+006 mm²	9.8201e+006 mm²
Statistics					
Nodes	21472	28416	35248	1227	356
Elements	3056	4048	5024	1124	306

TABLE 8
sector 1, Case 2 > Geometry > Parts

Object Name	*Right End Plate Aluminum Casing*	*Right End Plate Polyurethane*	*Right End Plate Inner Steel Slice*	*Right End Plate Inner Steel Slice*	*Left End Plate Aluminum Casing*
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Structural Steel				
Stiffness Behavior	Flexible				Flexible
Nonlinear Material Effects	Yes				
Coordinate System	Global Coordinate System				
Thickness			1.2192 mm		
Thickness Mode			Manual		
Bounding Box					
Length X	279.55 mm	278.03 mm	2288.5 mm	282.76 mm	279.43 mm
Length Y	485.98 mm	485.65 mm	3963.7 mm	489.75 mm	485.62 mm

Length Z	221.63 mm	209.01 mm	2002.1 mm	221.63 mm	221.8 mm
Properties					
Volume	6594.9 mm³	77820 mm³	2.9942e+006 mm³	28917 mm³	5783.7 mm³
Mass	5.177e-002 kg	0.61089 kg	23.505 kg	0.227 kg	4.5402e-002 kg
Centroid X	-2226.4 mm	-2196.7 mm			2230.1 mm
Centroid Y	3832.2 mm	3777.9 mm			3838.7 mm
Centroid Z	-1442. mm	-1439.5 mm			-1444.7 mm
Moment of Inertia Ip1	1902.8 kg·mm²	16849 kg·mm²			1710.3 kg·mm²
Moment of Inertia Ip2	3.0178 kg·mm²	42.042 kg·mm²			3.0705 kg·mm²
Moment of Inertia Ip3	1898.7 kg·mm²	16808 kg·mm²			1706.8 kg·mm²
Surface Area (approx.)			2.4559e+006 mm²	23718 mm²	
Statistics					
Nodes	551	200	177	74	535
Elements	222	16	131	39	179

TABLE 9
sector 1, Case 2 > Geometry > Parts

Object Name	*Left End Plate Polyurethane*	*Left End Plate Inner Steel Slice*	*Back Plate Aluminum Casing*	*Back Plate Aluminum Casing*	*Back Plate Polyurethane*
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Structural Steel				
Stiffness Behavior	Flexible		Flexible		
Nonlinear Material Effects	Yes				
Coordinate System	Global Coordinate System				
Thickness		1.2192 mm			
Thickness Mode		Manual			
Bounding Box					
Length X	277.98 mm	282.71 mm	593.43 mm	597.61 mm	581.91 mm
Length Y	485.81 mm	489.67 mm	22.343 mm	22.263 mm	19.565 mm
Length Z	209.71 mm	221.8 mm	41.715 mm	41.688 mm	33.206 mm
Properties					
Volume	78618 mm³	28942 mm³	61467 mm³	66706 mm³	1.8333e+005 mm³
Mass	0.61716 kg	0.2272 kg	0.48252 kg	0.52364 kg	1.4392 kg
Centroid X	2196.7 mm		2059.2 mm	-2060.2 mm	2038.2 mm
Centroid Y	3778. mm		4035. mm		4029.4 mm
Centroid Z	-1439.3 mm		-1512.8 mm	-1513.1 mm	-1530.2 mm
Moment of Inertia Ip1	17017 kg·mm²		18.145 kg·mm²	19.008 kg·mm²	131.49 kg·mm²

Moment of Inertia Ip2	44.279 kg·mm²		15217 kg·mm²	16547 kg·mm²	39987 kg·mm²
Moment of Inertia Ip3	16974 kg·mm²		15210 kg·mm²	16540 kg·mm²	39880 kg·mm²
Surface Area (approx.)		23739 mm²			
Statistics					
Nodes	200	72	247	356	200
Elements	16	37	22	116	16

TABLE 10
sector 1, Case 2 > Geometry > Parts

Object Name	*Back Plate Polyurethane*	*Back Plate Inner Steel Slice*	*Back Plate Inner Steel Slice*	*Right Front Triangular Constraint*	*Left Front Triangular Constraint*
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Structural Steel			Aluminum	
Stiffness Behavior	Flexible			Flexible	
Nonlinear Material Effects	Yes				
Coordinate System	Global Coordinate System				
Thickness		1.2192 mm			
Thickness Mode		Manual			
Bounding Box					
Length X	586.04 mm	588.24 mm	589.33 mm	500.01 mm	
Length Y	18.999 mm	10.975 mm		425.63 mm	
Length Z	31.847 mm	38.627 mm		193.25 mm	193.26 mm
Properties					
Volume	1.7425e+005 mm³	28589 mm³	28753 mm³	4.3996e+006 mm³	4.3997e+006 mm³
Mass	1.3678 kg	0.22443 kg	0.22571 kg	11.879 kg	
Centroid X	-2039.6 mm			-2010.3 mm	2010.4 mm
Centroid Y	4029.2 mm			3755.7 mm	3755.8 mm
Centroid Z	-1531. mm			-1915. mm	-1914.3 mm
Moment of Inertia Ip1	114.95 kg·mm²			1.3148e+005 kg·mm²	1.3149e+005 kg·mm²
Moment of Inertia Ip2	38572 kg·mm²			1.2327e+005 kg·mm²	
Moment of Inertia Ip3	38480 kg·mm²			2.5158e+005 kg·mm²	2.5159e+005 kg·mm²
Surface Area (approx.)		23449 mm²	23583 mm²		
Statistics					
Nodes	200	78	103	197	223
Elements	16	42	67	22	25

TABLE 11
sector 1, Case 2 > Geometry > Parts

Object Name	*Hexcel*	*Left Rear Tri constraint*	*Right Rear Tri Constraint*	*Left Rear Tri Constraint1*	*Left Rear Tri Constraint2*
State	Meshed				
Graphics Properties					
Visible	Yes				
Transparency	1				
Definition					
Suppressed	No				
Material	Structural Steel	Aluminum			
Stiffness Behavior	Flexible				
Nonlinear Material Effects	Yes				
Coordinate System	Global Coordinate System				
Thickness				1.2192 mm	
Thickness Mode				Manual	
Bounding Box					
Length X	4123.2 mm	600. mm		592.08 mm	
Length Y	3974.6 mm	500.79 mm		487.08 mm	
Length Z	1540.7 mm	223.59 mm		185.02 mm	
Properties					
Volume	3.8027e+008 mm³	6.0352e+006 mm³		1.8806e+005 mm³	
Mass	2985.1 kg	16.295 kg		0.50776 kg	
Centroid X	4.4139e-004 mm	2049.6 mm	-2049.6 mm		
Centroid Y	2646.9 mm	3872.1 mm			
Centroid Z	-1000.6 mm	-1465.9 mm			
Moment of Inertia Ip1	2.9165e+009 kg·mm²	2.557e+005 kg·mm²			
Moment of Inertia Ip2	2.415e+009 kg·mm²	2.3933e+005 kg·mm²			
Moment of Inertia Ip3	5.3345e+009 kg·mm²	4.9099e+005 kg·mm²			
Surface Area (approx.)				1.5425e+005 mm²	
Statistics					
Nodes	20976	258	223	203	207
Elements	10142	30	25	165	169

TABLE 12
sector 1, Case 2 > Geometry > Parts

Object Name	*Right Rear Tri Constraint1*	*Right Rear Tri Constraint2*
State	Meshed	
Graphics Properties		
Visible	Yes	
Transparency	1	
Definition		
Suppressed	No	
Material	Aluminum	
Nonlinear Material Effects	Yes	

Coordinate System	Global Coordinate System	
Thickness	1.2192 mm	
Thickness Mode	Manual	
Bounding Box		
Length X	592.08 mm	
Length Y	487.08 mm	
Length Z	185.02 mm	
Properties		
Volume	1.8806e+005 mm³	
Mass	0.50776 kg	
Surface Area(approx.)	1.5425e+005 mm²	
Statistics		
Nodes	206	205
Elements	169	170

Coordinate Systems

TABLE 13
sector 1, Case 2 > Coordinate Systems > Coordinate System

Object Name	*Global Coordinate System*
State	Fully Defined
Definition	
Type	Cartesian
Ansys System Number	0.
Origin	
Origin X	0. mm
Origin Y	0. mm
Origin Z	0. mm
Directional Vectors	
X Axis Data	[1. 0. 0.]
Y Axis Data	[0. 1. 0.]
Z Axis Data	[0. 0. 1.]

Connections

TABLE 14
sector 1, Case 2 > Connections

Object Name	*Connections*
State	Fully Defined
Auto Detection	
Generate Contact On Update	Yes
Tolerance Type	Slider
Tolerance Slider	0.
Tolerance Value	16.48 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 15
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Bonded - Nose Plate To Left End Plate Aluminum Casing*	*Bonded - Nose Plate To Left End Plate Inner Steel Slice*	*Bonded - Right End Plate Upstream Hole Area To Right End Plate Polyurethane*	*Bonded - Right End Plate Upstream Hole Area To Right End Plate Outer Steel Slice*	*Bonded - Right End Plate Downstream Hole Area To Right End Plate Polyurethane*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	2 Faces	1 Face	4 Faces	1 Face	4 Faces
Target	2 Faces	1 Face	4 Faces	1 Face	4 Faces
Contact Bodies	Nose Plate		Right End Plate Upstream Hole Area		Right End Plate Downstream Hole Area
Target Bodies	Left End Plate Aluminum Casing	Left End Plate Inner Steel Slice	Right End Plate Polyurethane	Right End Plate Outer Steel Slice	Right End Plate 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 16
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Bonded - Right End Plate Downstream Hole Area To Right End Plate Outer Steel Slice*	*Bonded - Right End Plate Aluminum Casing To Right End Plate Inner Steel Slice*	*Bonded - Right End Plate Aluminum Casing To Right End Plate Outer Steel Slice*	*Bonded - Right End Plate Polyurethane To Right End Plate Outer Steel Slice*	*Bonded - Left End Plate Downstream Hole Area To Left End Plate Polyurethane*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				4 Faces
Target	1 Face				4 Faces

Contact Bodies	Right End Plate Downstream Hole Area	Right End Plate Aluminum Casing		Right End Plate Polyurethane	Left End Plate Downstream Hole Area
Target Bodies	Right End Plate Outer Steel Slice	Right End Plate Inner Steel Slice	Right End Plate Outer Steel Slice		Left End Plate 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
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Bonded - Left End Plate Downstream Hole Area To Left End Plate Outer Steel Slice*	*Bonded - Left End Plate Downstream Hole Area To Left End Plate Inner Steel Slice*	*Bonded - Left End Plate Upstream Hole Area To Left End Plate Polyurethane*	*Bonded - Left End Plate Upstream Hole Area To Left End Plate Outer Steel Slice*	*Bonded - Left End Plate Upstream Hole Area To Left End Plate Inner Steel Slice*
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 End Plate Downstream Hole Area		Left End Plate Upstream Hole Area		
Target Bodies	Left End Plate Outer Steel Slice	Left End Plate Inner Steel Slice	Left End Plate Polyurethane	Left End Plate Outer Steel Slice	Left End Plate 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
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Bonded - Left End Plate Aluminum Casing To Left End Plate Outer Steel Slice*	*Bonded - Left End Plate Aluminum Casing To Left End Plate Inner Steel Slice*	*Bonded - Left End Plate Polyurethane To Left End Plate Outer Steel Slice*	*Bonded - Left End Plate Polyurethane To Left End Plate Inner Steel Slice*	*Bonded - Back Plate Polyurethane To Back Plate Inner Steel Slice*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face	2 Faces	1 Face	2 Faces	3 Faces
Target	1 Face				
Contact Bodies	Left End Plate Aluminum Casing		Left End Plate Polyurethane		Back Plate Polyurethane
Target Bodies	Left End Plate Outer Steel Slice	Left End Plate Inner Steel Slice	Left End Plate Outer Steel Slice	Left End Plate Inner Steel Slice	Back Plate 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
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Bonded - Back Plate Polyurethane To Back Plate Outer Steel Slice*	*Bonded - Back Plate Aluminum Casing To Right End Plate Aluminum Casing*	*Bonded - Back Plate Aluminum Casing To Left End Plate Aluminum Casing*	*Bonded - Left End Plate Aluminum Casing To Rod 6*	*Bonded - Back Plate Aluminum Casing To Back Plate Outer Steel Slice*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	3 Faces	1 Edge		1 Face	
Target	1 Face	1 Edge		1 Face	
Contact Bodies	Back Plate Polyurethane	Back Plate Aluminum Casing		Left End Plate Aluminum Casing	Back Plate Aluminum Casing
Target Bodies	Back Plate Outer Steel Slice	Right End Plate Aluminum Casing	Left End Plate Aluminum Casing	Rod 6	Back Plate Outer Steel Slice

Definition			
Type	Bonded		
Scope Mode	Automatic	Manual	Automatic
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	Program Controlled
Pinball Radius		20. mm	

TABLE 20
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Bonded - Nose Plate To Right End Plate Polyurethane*	*Bonded - Nose Plate To Left End Plate Polyurethane*	*Bonded - Left End Plate Aluminum Casing To Rod 1*	*Bonded - Left End Plate Aluminum Casing To Rod 2*	*Bonded - Left End Plate Aluminum Casing To Rod 3*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	2 Faces		1 Face		
Target	2 Faces		1 Face		
Contact Bodies	Nose Plate		Left End Plate Aluminum Casing		
Target Bodies	Right End Plate Polyurethane	Left End Plate Polyurethane	Rod 1	Rod 2	Rod 3
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
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Bonded - Left End Plate Aluminum*	*Bonded - Left End Plate Aluminum*	*Bonded - Right End Plate Inner*	*Bonded - Left End Plate Aluminum*	*Bonded - Back Plate Aluminum*

	Casing To Rod 4	*Casing To Rod 5*	*Steel Slice To Hexcel*	*Casing To Hexcel*	*Casing To Hexcel*
State	Fully Defined		Suppressed		
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				1 Edge
Target	1 Face		No Selection		
Contact Bodies	Left End Plate Aluminum Casing		Right End Plate Inner Steel Slice	Left End Plate Aluminum Casing	Back Plate Aluminum Casing
Target Bodies	Rod 4	Rod 5	No Selection		
Definition					
Type	Bonded				
Scope Mode	Automatic		Manual		
Behavior	Symmetric				
Suppressed	No		Yes		
Advanced					
Formulation	Pure Penalty				
Normal Stiffness	Program Controlled				
Update Stiffness	Never				
Thermal Conductance	Program Controlled				
Pinball Region	Program Controlled		Radius		Program Controlled
Pinball Radius			5. mm		

TABLE 22
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Bonded - Left End Plate Aluminum Casing To Hexcel*	*Bonded - Right End Plate Polyurethane To Right End Plate Outer Steel Slice*	*Bonded - Back Plate Polyurethane To Back Plate Outer Steel Slice*	*Bonded - Hexcel Inner Carbon Fiber Slice To Hexcel*	*Bonded - Hexcel Outer Carbon Fiber Slice To Hexcel*
State	Suppressed	Fully Defined		Suppressed	
Scope					
Scoping Method	Geometry Selection				
Contact	1 Edge	1 Face			
Target	No Selection	1 Face		No Selection	
Contact Bodies	Left End Plate Aluminum Casing	Right End Plate Polyurethane	Back Plate Polyurethane	Hexcel Inner Carbon Fiber Slice	Hexcel Outer Carbon Fiber Slice
Target Bodies	No Selection	Right End Plate Outer Steel Slice	Back Plate Outer Steel Slice	No Selection	
Definition					
Type	Bonded				
Scope Mode	Manual				
Suppressed	Yes	No		Yes	
Behavior		Symmetric			
Advanced					
Formulation	Pure Penalty				

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

TABLE 23
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 67*	*Bonded - Back Plate Aluminum Casing To Left End Plate Aluminum Casing*	*Contact Region 61*	*Contact Region 62*	*Contact Region 63*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face	1 Edge	1 Face		
Target	1 Face	1 Edge	1 Face		
Contact Bodies	Hexcel Outer Carbon Fiber Slice	Back Plate Aluminum Casing	Nose Plate	Right End Plate Upstream Hole Area	
Target Bodies	Hexcel Inner Carbon Fiber Slice	Left End Plate Aluminum Casing	Right End Plate Inner Steel Slice		Right Front Triangular Constraint
Definition					
Type	Bonded				
Scope Mode	Automatic	Manual	Automatic		
Behavior	Symmetric		Symmetric		
Suppressed	No				
Advanced					
Formulation	Pure Penalty				
Normal Stiffness	Program Controlled				
Update Stiffness	Never				
Thermal Conductance	Program Controlled				
Pinball Region	Program Controlled				

TABLE 24
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 64*	*Contact Region 65*	*Contact Region 83*	*Contact Region 84*	*Contact Region 85*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face	4 Faces	2 Faces		1 Face
Target	1 Face	4 Faces	1 Face		
Contact Bodies	Right End Plate Downstream Hole Area	Right End Plate Aluminum Casing	Right End Plate Polyurethane		
Target Bodies	Right End Plate Inner Steel Slice	Right End Plate Polyurethane	Right End Plate Inner Steel Slice		Right Front Triangular Constraint

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
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 88*	*Contact Region 89*	*Contact Region 91*	*Contact Region 92*	*Contact Region 93*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	4 Faces	1 Face	4 Faces	2 Faces	
Target	4 Faces	1 Face	3 Faces	2 Faces	1 Face
Contact Bodies	Left End Plate Aluminum Casing				
Target Bodies	Left End Plate Polyurethane	Back Plate Aluminum Casing	Left End Plate Aluminum Casing	Left End Plate Polyurethane	Left End Plate 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 26
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 94*	*Contact Region 96*	*Contact Region 97*	*Contact Region 98*	*Contact Region 99*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face	2 Faces	4 Faces	2 Faces	1 Face
Target	1 Face		3 Faces	1 Face	
Contact Bodies	Left End Plate Aluminum Casing	Left End Plate Polyurethane			
Target Bodies	Left Front Triangular	Left End Plate Aluminum Casing	Left End Plate Polyurethane	Left End Plate Inner Steel Slice	Left Front Triangular

	Constraint				Constraint
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 27
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 100*	*Contact Region 101*	*Contact Region 102*	*Contact Region 103*	*Contact Region 104*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face			6 Faces	4 Faces
Target	2 Faces		1 Face	4 Faces	1 Face
Contact Bodies	Left End Plate Inner Steel Slice			Back Plate Aluminum Casing	
Target Bodies	Left End Plate Aluminum Casing	Left End Plate Polyurethane	Left Front Triangular Constraint	Back Plate Polyurethane	Back Plate 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 28
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 105*	*Contact Region 106*	*Contact Region 107*	*Contact Region 108*	*Contact Region 109*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	5 Faces		2 Faces	3 Faces	2 Faces
Target	4 Faces	5 Faces	1 Face	2 Faces	1 Face
Contact Bodies	Back Plate Aluminum Casing				

Target Bodies	Back Plate Aluminum Casing	Back Plate Polyurethane	Back Plate 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 29
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 112*	*Contact Region 113*	*Contact Region 114*	*Contact Region 115*	*Contact Region 116*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face	2 Faces		1 Face	3 Faces
Target	1 Face				3 Faces
Contact Bodies	Back Plate Aluminum Casing	Back Plate Polyurethane			
Target Bodies	Left Front Triangular Constraint	Hexcel Outer Carbon Fiber Slice	Hexcel Inner Carbon Fiber Slice	Back Plate 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 30
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 117*	*Contact Region 118*	*Contact Region 119*	*Contact Region 121*	*Contact Region 122*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	3 Faces		2 Faces	1 Face	
Target	3 Faces		1 Face		
Contact Bodies	Back Plate Polyurethane				
Target Bodies	Back Plate Polyurethane		Back Plate Inner	Right Front	Left Front Triangular

		Steel Slice	Triangular Constraint	Constraint
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 31
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 123*	*Contact Region 124*	*Contact Region 125*	*Contact Region 126*	*Contact Region 127*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	2 Faces				1 Face
Contact Bodies	Back Plate Inner Steel Slice				
Target Bodies	Back Plate Aluminum Casing		Back Plate Polyurethane		Back Plate 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 32
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 128*	*Contact Region 129*	*Contact Region 130*	*Contact Region 131*	*Contact Region 132*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Back Plate Inner Steel Slice		Hexcel Outer Carbon Fiber Slice		Hexcel Inner Carbon Fiber Slice
Target Bodies	Right Front Triangular	Left Front Triangular	Back Plate Polyurethane		

	Constraint	Constraint	
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 33
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 133*	*Contact Region 141*	*Contact Region 142*	*Contact Region 143*	*Contact Region 144*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face		3 Faces	2 Faces	
Target	1 Face		3 Faces	1 Face	
Contact Bodies	Hexcel Inner Carbon Fiber Slice	Right End Plate Inner Steel Slice	Left End Plate Aluminum Casing		Left End Plate Polyurethane
Target Bodies	Back Plate Polyurethane	Right Front Triangular Constraint	Left End Plate Polyurethane	Left End Plate 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 34
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 145*	*Contact Region 146*	*Contact Region 147*	*Contact Region 148*	*Contact Region 149*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	2 Faces				
Target	2 Faces	1 Face	2 Faces	1 Face	
Contact Bodies	Back Plate Aluminum Casing				Back Plate Polyurethane

Target Bodies	Back Plate Polyurethane	Back Plate Inner Steel Slice	Back Plate Polyurethane	Back Plate 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 35
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 150*	*Contact Region 135*	*Contact Region 151*	*Contact Region 152*	*Contact Region 153*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	2 Faces				1 Face
Target	1 Face				
Contact Bodies	Back Plate Polyurethane	Right End Plate Polyurethane	Left End Plate Aluminum Casing	Left End Plate Polyurethane	Left End Plate Inner Steel Slice
Target Bodies	Back Plate Inner Steel Slice	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 36
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 154*	*Contact Region 155*	*Contact Region 156*	*Contact Region 157*	*Contact Region 158*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face	2 Faces	1 Face		

Target	1 Face				
Contact Bodies	Back Plate Aluminum Casing	Back Plate Polyurethane	Back Plate Inner Steel Slice	Hexcel Outer Carbon Fiber Slice	Hexcel Inner Carbon Fiber Slice
Target Bodies	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 37
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 159*	*Contact Region 160*	*Contact Region 161*	*Contact Region 162*	*Contact Region 163*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	2 Faces	1 Face			
Target	2 Faces	1 Face			
Contact Bodies	Right End Plate Aluminum Casing	Right End Plate Polyurethane	Right End Plate Inner Steel Slice	Left End Plate Aluminum Casing	
Target Bodies	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 38
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 164*	*Contact Region 165*	*Contact Region 166*	*Contact Region 167*	*Contact Region 168*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	2 Faces		1 Face		
Target	2 Faces		1 Face		

Contact Bodies	Left End Plate Polyurethane	Back Plate Aluminum Casing	Back Plate Polyurethane
Target Bodies	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 39
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 169*	*Contact Region 170*	*Contact Region 171*	*Contact Region 172*	*Contact Region 173*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	2 Faces	1 Face			
Target	2 Faces	1 Face			
Contact Bodies	Nose Plate	Right End Plate Aluminum Casing			
Target Bodies	Right End Plate Aluminum Casing	Rod 6	Rod 1	Rod 2	Rod 3
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 40
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 174*	*Contact Region 175*	*Contact Region 177*	*Contact Region 178*	*Contact Region 179*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face		2 Faces		1 Face
Target	1 Face				
Contact Bodies	Right End Plate Aluminum Casing				
					Right Front Triangular

Target Bodies	Rod 4	Rod 5	Right End Plate Inner Steel Slice	Constraint
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 41
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 180*	*Contact Region 182*	*Contact Region 183*	*Contact Region 184*	*Contact Region 186*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	2 Faces	5 Faces	1 Face		4 Faces
Target	1 Face	3 Faces	1 Face		3 Faces
Contact Bodies	Right End Plate Aluminum Casing				Right End Plate Polyurethane
Target Bodies	Hexcel	Right Rear Tri Constraint	Right Rear Tri Constraint1	Right Rear Tri Constraint2	Right Rear Tri Constraint
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 42
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 187*	*Contact Region 188*	*Contact Region 189*	*Contact Region 192*	*Contact Region 194*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face			3 Faces	
Target	1 Face			2 Faces	
Contact Bodies	Right End Plate Polyurethane		Right End Plate Inner Steel Slice	Left End Plate Aluminum Casing	Left End Plate Polyurethane
Target Bodies	Right Rear Tri	Right Rear Tri	Right Rear Tri	Left Rear Tri constraint	

	Constraint1	Constraint2	Constraint	
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 43
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 195*	*Contact Region 196*	*Contact Region 197*	*Contact Region 198*	*Contact Region 199*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face	5 Faces		1 Face	
Target	1 Face	4 Faces	5 Faces	1 Face	
Contact Bodies	Left End Plate Inner Steel Slice	Back Plate Aluminum Casing			
Target Bodies	Left Rear Tri constraint		Right Rear Tri Constraint	Left Rear Tri Constraint1	Left Rear Tri Constraint2
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 44
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 200*	*Contact Region 201*	*Contact Region 202*	*Contact Region 203*	*Contact Region 204*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face		3 Faces		1 Face
Target	1 Face		3 Faces		1 Face
Contact Bodies	Back Plate Aluminum Casing		Back Plate Polyurethane		
Target Bodies	Right Rear Tri Constraint1	Right Rear Tri Constraint2	Left Rear Tri constraint	Right Rear Tri Constraint	Left Rear Tri Constraint1

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 45
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 205*	*Contact Region 206*	*Contact Region 207*	*Contact Region 208*	*Contact Region 209*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Back Plate Polyurethane			Back Plate Inner Steel Slice	
Target Bodies	Left Rear Tri Constraint2	Right Rear Tri Constraint1	Right Rear Tri Constraint2	Left Rear Tri constraint	Right Rear Tri Constraint
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 46
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 211*	*Contact Region 212*	*Contact Region 213*	*Contact Region 214*	*Contact Region 215*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face			2 Faces	1 Face
Target	1 Face				
Contact Bodies	Right End Plate Aluminum Casing			Right End Plate Polyurethane	
Target Bodies	Right Rear Tri Constraint	Right Rear Tri Constraint1	Right Rear Tri Constraint2	Right End Plate Inner Steel Slice	Right Rear Tri Constraint
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 47
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 216*	*Contact Region 217*	*Contact Region 218*	*Contact Region 219*	*Contact Region 220*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Right End Plate Polyurethane		Right End Plate Inner Steel Slice		Left End Plate Aluminum Casing
Target Bodies	Right Rear Tri Constraint1	Right Rear Tri Constraint2	Right Rear Tri Constraint		Left Rear Tri constraint
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 48
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 221*	*Contact Region 222*	*Contact Region 223*	*Contact Region 224*	*Contact Region 225*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Left End Plate Polyurethane	Left End Plate Inner Steel Slice	Back Plate Aluminum Casing		
Target Bodies	Left Rear Tri constraint			Left Rear Tri Constraint1	Left Rear Tri Constraint2
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 49
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 226*	*Contact Region 227*	*Contact Region 228*	*Contact Region 229*	*Contact Region 230*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Back Plate Aluminum Casing		Back Plate Polyurethane		
Target Bodies	Right Rear Tri Constraint1	Right Rear Tri Constraint2	Left Rear Tri Constraint1	Left Rear Tri Constraint2	Right Rear Tri Constraint1
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 50
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 231*	*Contact Region 232*	*Contact Region 233*	*Contact Region 236*	*Contact Region 237*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Back Plate Polyurethane	Back Plate Inner Steel Slice		Hexcel	
Target Bodies	Right Rear Tri Constraint2	Left Rear Tri constraint	Right Rear Tri Constraint	Left Rear Tri constraint	Right Rear Tri Constraint
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 51
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 238*	*Contact Region 239*	*Contact Region 240*	*Contact Region 241*	*Contact Region 242*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face				
Target	1 Face				
Contact Bodies	Left Rear Tri constraint		Right Rear Tri Constraint		Left Rear Tri Constraint1
Target Bodies	Left Rear Tri Constraint1	Left Rear Tri Constraint2	Right Rear Tri Constraint1	Right Rear Tri Constraint2	Left Rear Tri Constraint2
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 52
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 243*	*Contact Region 234*	*Contact Region 235*	*Contact Region 244*	*Contact Region 245*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face		5 Faces	1 Face	4 Faces
Target	1 Face		3 Faces	1 Face	3 Faces
Contact Bodies	Right Rear Tri Constraint1	Right End Plate Aluminum Casing		Right End Plate Polyurethane	
Target Bodies	Right Rear Tri Constraint2	Back Plate Aluminum Casing	Right End Plate Aluminum Casing		Right End Plate 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 53
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 246*	*Contact Region 248*	*Contact Region 249*	*Contact Region 250*	*Contact Region 251*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Contact	1 Face	3 Faces	1 Face	2 Faces	1 Face
Target	1 Face	3 Faces	1 Face		
Contact Bodies	Right End Plate Inner Steel Slice	Right End Plate Aluminum Casing			Right End Plate Polyurethane
Target Bodies	Right End Plate Aluminum Casing	Right End Plate Polyurethane	Right End Plate 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 54
sector 1, Case 2 > Connections > Contact Regions

Object Name	*Contact Region 210*	*Contact Region 252*
State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Contact	1 Face	
Target	1 Face	
Contact Bodies	Back Plate Aluminum Casing	Back Plate Polyurethane
Target Bodies	Back Plate 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

Mesh

TABLE 55
sector 1, Case 2 > Mesh

Object Name	*Mesh*
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	248785
Elements	69752

TABLE 56
sector 1, Case 2 > Mesh > Mesh Controls

Object Name	*Refinement 2*	*Refinement 4*	*Refinement*	*Refinement 5*
State	Fully Defined			
Scope				
Scoping Method	Geometry Selection			
Geometry	6 Faces	2 Faces	6 Faces	2 Faces
Definition				
Suppressed	No			
Refinement	1			

Static Structural

TABLE 57
sector 1, Case 2 > Analysis

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

TABLE 58
sector 1, Case 2 > 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	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\Al slit\change of directions\2 Simulation Files\Static Structural\
Future Analysis	None
Save ANSYS db	No
Delete Unneeded Files	Yes
Nonlinear Solution	No

FIGURE 1
sector 1, Case 2 > Static Structural > Figure

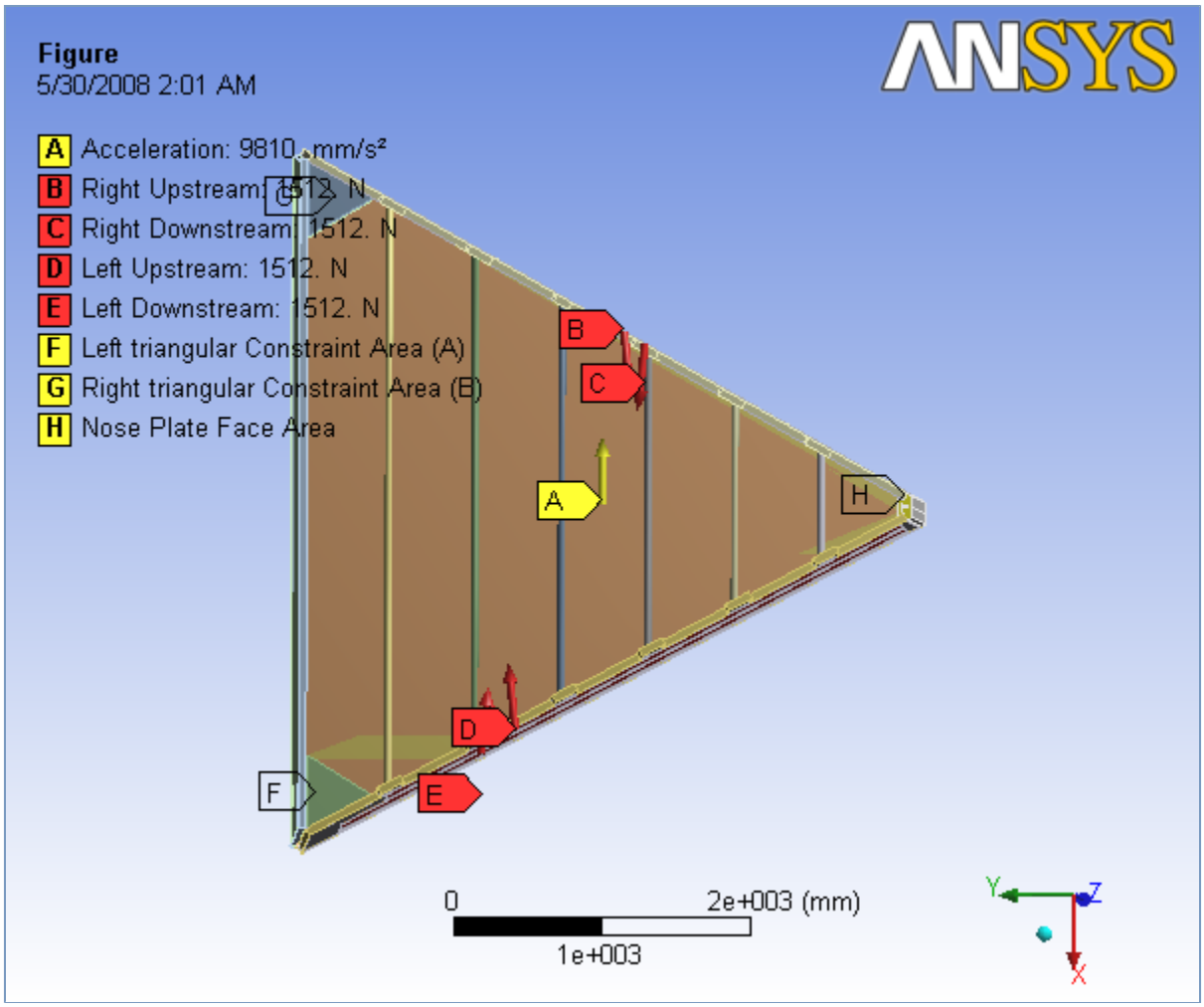


TABLE 59
sector 1, Case 2 > Static Structural > Accelerations

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
sector 1, Case 2 > Static Structural > Acceleration

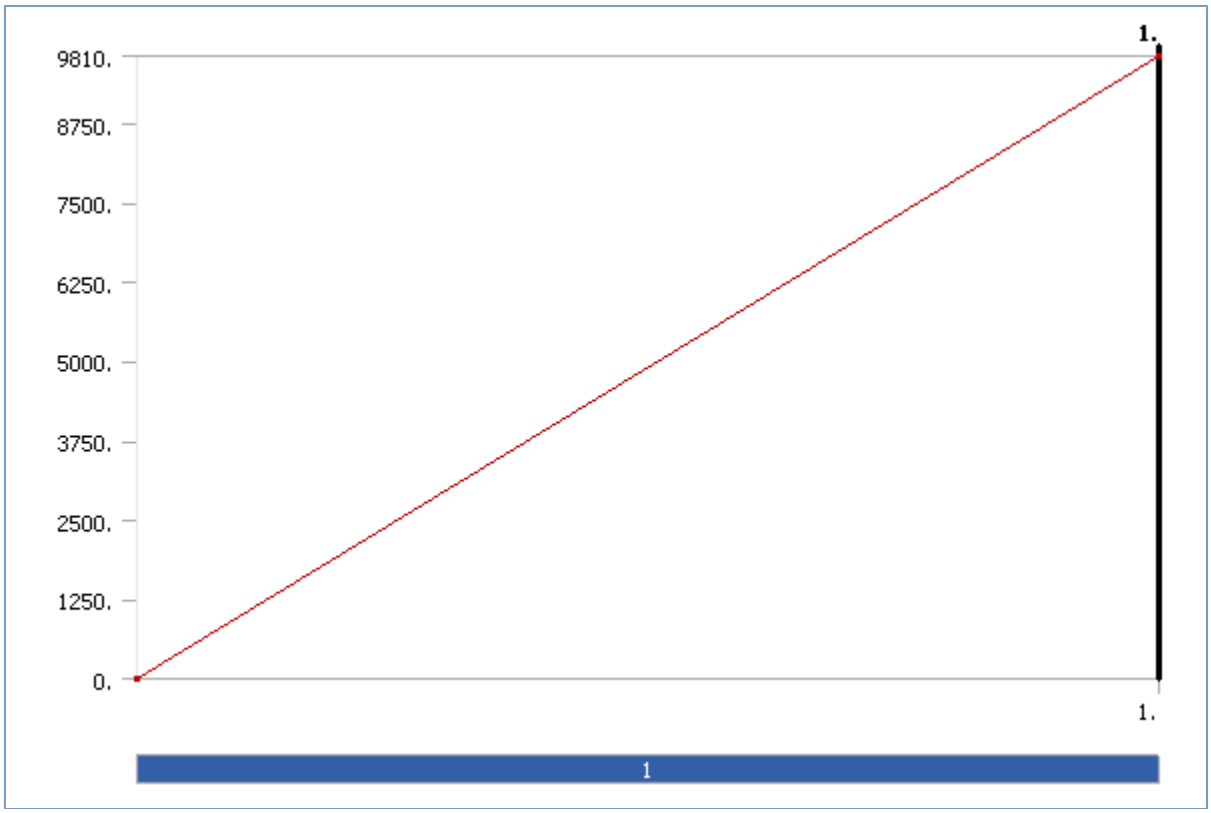


TABLE 60
sector 1, Case 2 > Static Structural > Loads

Object Name	*Left triangular Constraint Area (A)*	*Right triangular Constraint Area (B)*	*Nose Plate Face Area*	*Right Upstream*	*Right Downstream*
State	Fully Defined				
Scope					
Scoping Method	Geometry Selection				
Geometry	1 Face		2 Faces	1 Face	
Definition					
Define By	Components				
Type	Displacement			Force	
Coordinate System	Global Coordinate System				
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
sector 1, Case 2 > Static Structural > Left triangular Constraint Area (A)

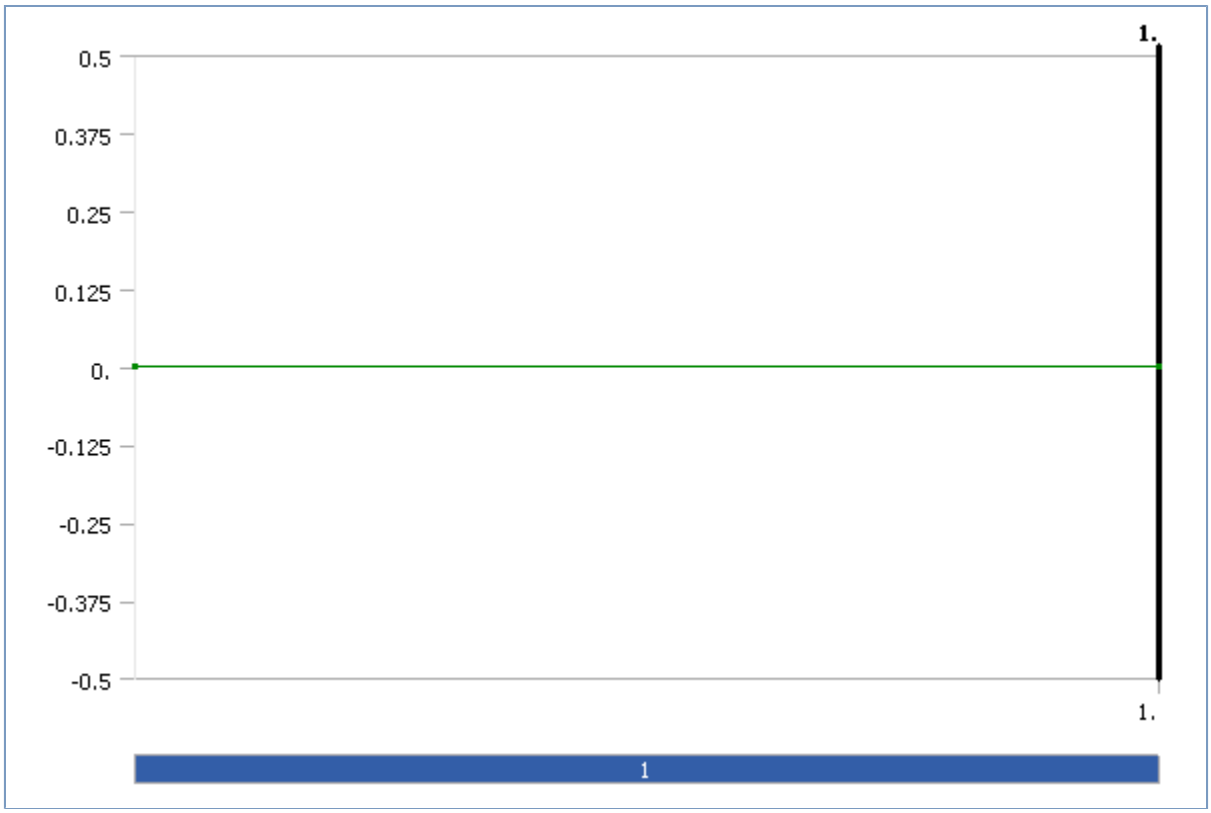


FIGURE 4
sector 1, Case 2 > Static Structural > Right triangular Constraint Area (B)

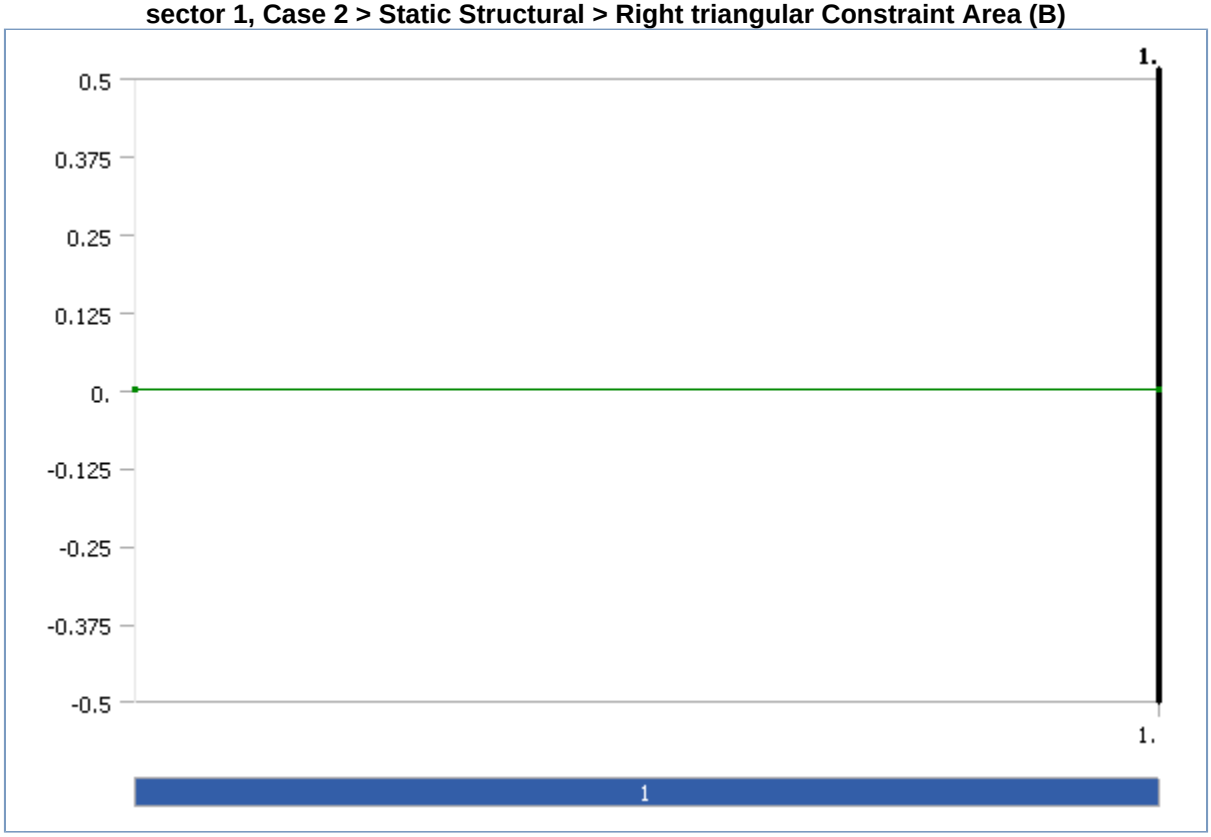


FIGURE 5
sector 1, Case 2 > Static Structural > Nose Plate Face Area

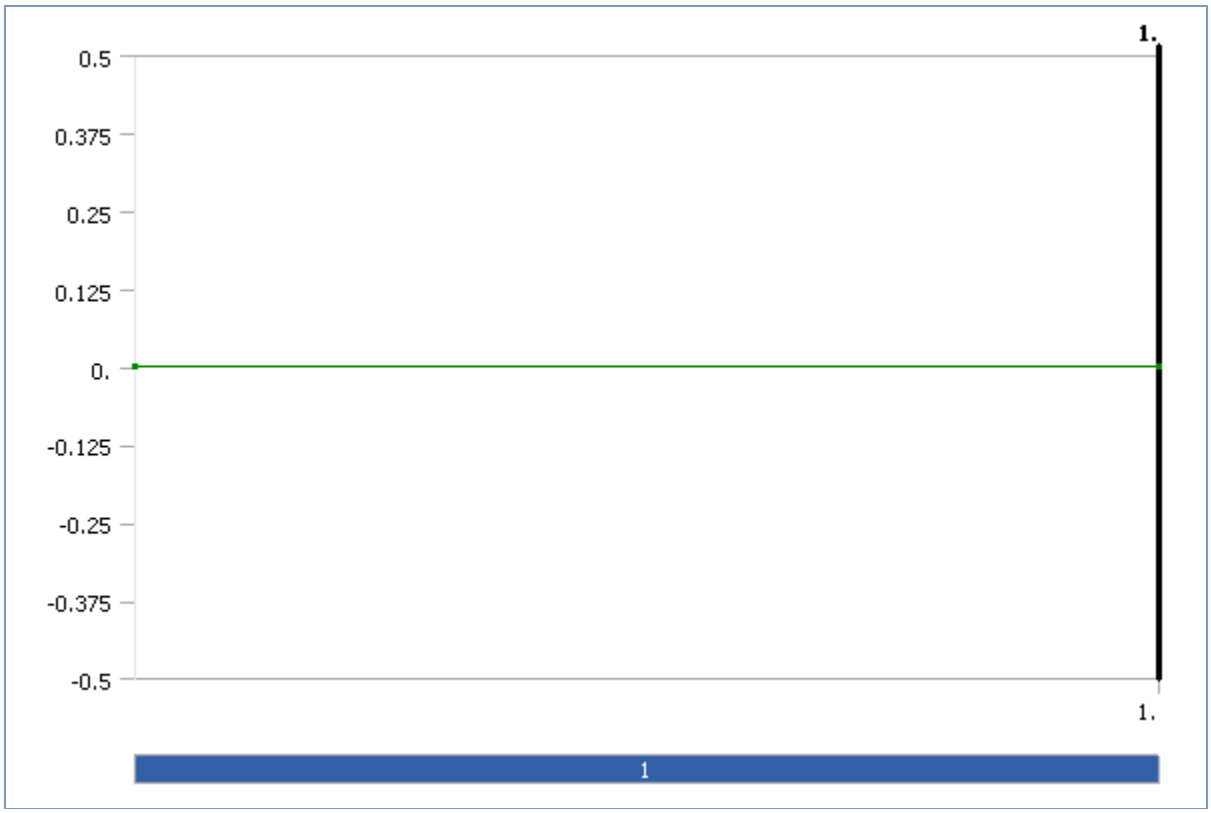


FIGURE 6
sector 1, Case 2 > Static Structural > Right Upstream

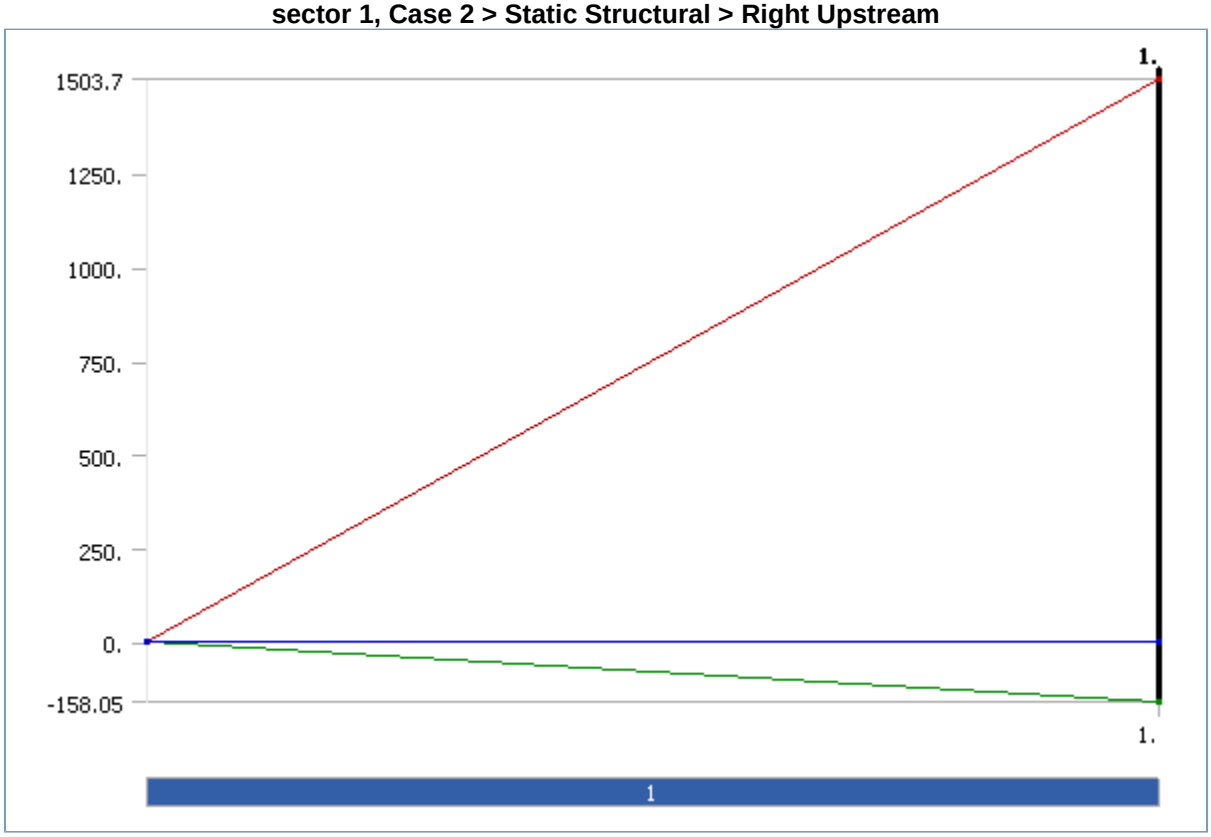


FIGURE 7
sector 1, Case 2 > Static Structural > Right Downstream

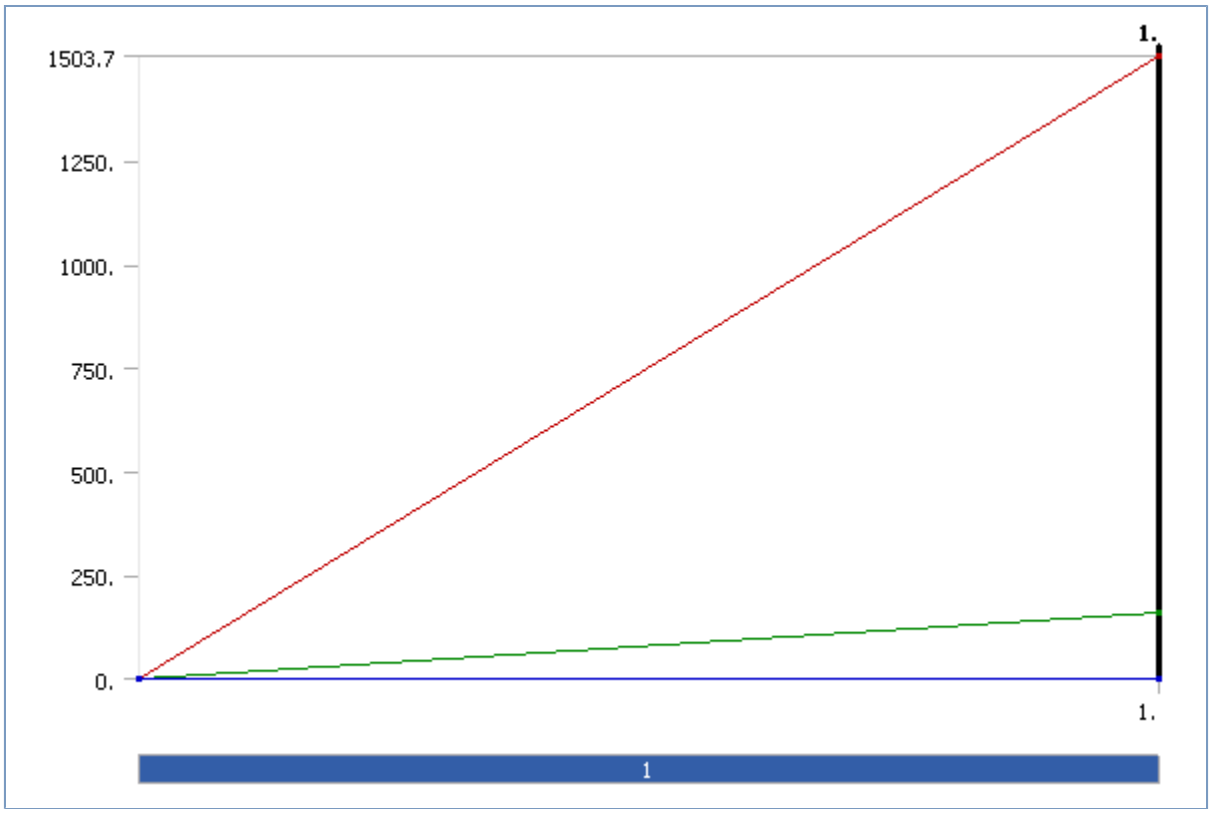


TABLE 61
sector 1, Case 2 > Static Structural > Loads

Object Name	*Left Upstream*	*Left Downstream*
State	Fully Defined	
Scope		
Scoping Method	Geometry Selection	
Geometry	1 Face	
Definition		
Define By	Components	
Type	Force	
Coordinate System	Global Coordinate System	
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
sector 1, Case 2 > Static Structural > Left Upstream

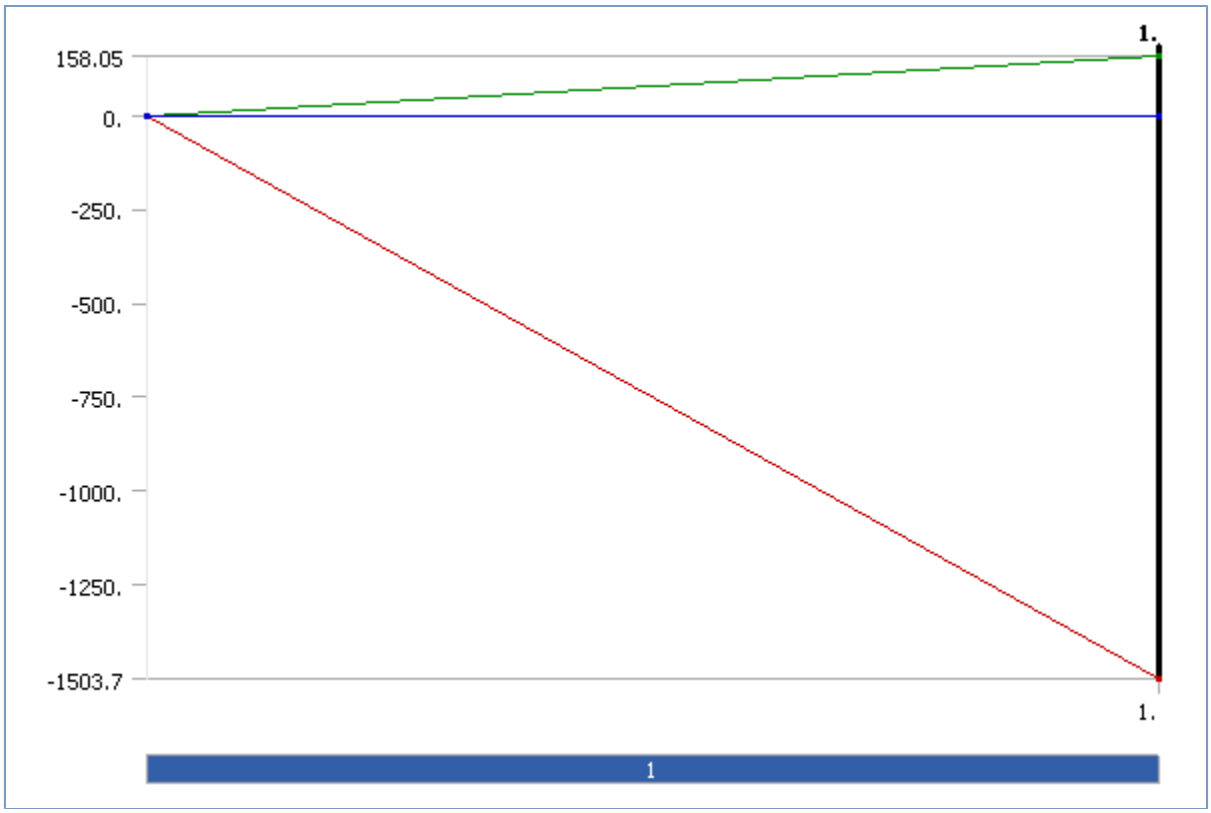
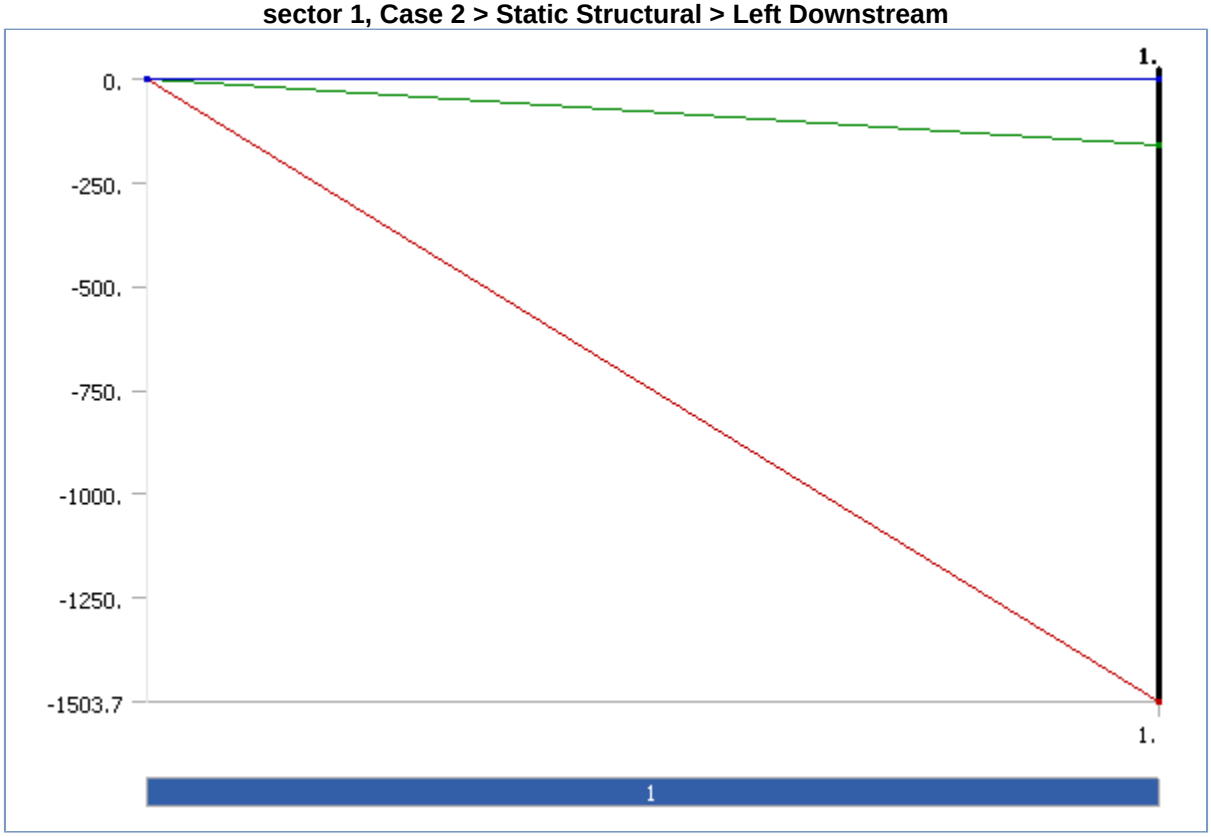


FIGURE 9
sector 1, Case 2 > Static Structural > Left Downstream



Solution

TABLE 62
sector 1, Case 2 > Static Structural > Solution

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

TABLE 63
sector 1, Case 2 > 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 64
sector 1, Case 2 > 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	
Coordinate System		Global Coordinate System			
Shell					Top/Bottom
Results					
Minimum	3.8608e-003 mm	-1.1654e-003 mm	-2.1045e-002 mm	-1.8364e-002 mm	1.1373e-005 MPa
Maximum	3.8544e-002 mm	3.8523e-002 mm	1.155e-002 mm	5.5321e-003 mm	5.5484 MPa
Minimum Occurs On	Back Plate Polyurethane	Left End Plate Outer Steel Slice	Right End Plate Aluminum Casing	Rod 5	Back Plate Polyurethane
Maximum Occurs On	Right End Plate Aluminum Casing		Rod 6	Back Plate Polyurethane	Hexcel
Information					
Time	1. s				
Load Step	1				
Substep	1				
Iteration Number	1				

FIGURE 10
sector 1, Case 2 > Static Structural > Solution > Total Deformation > Figure

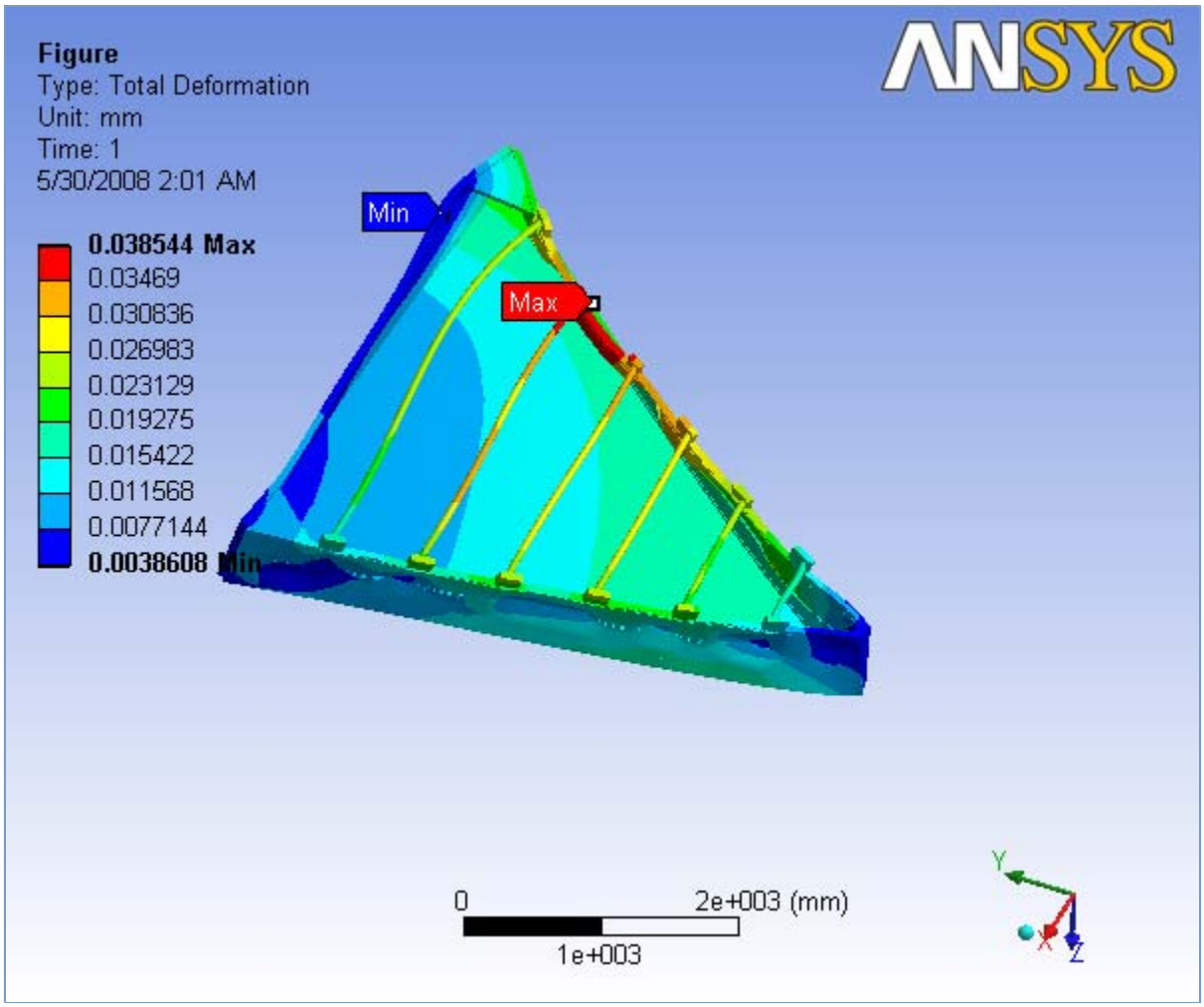


FIGURE 11
sector 1, Case 2 > Static Structural > Solution > X - Directional Deformation > Figure

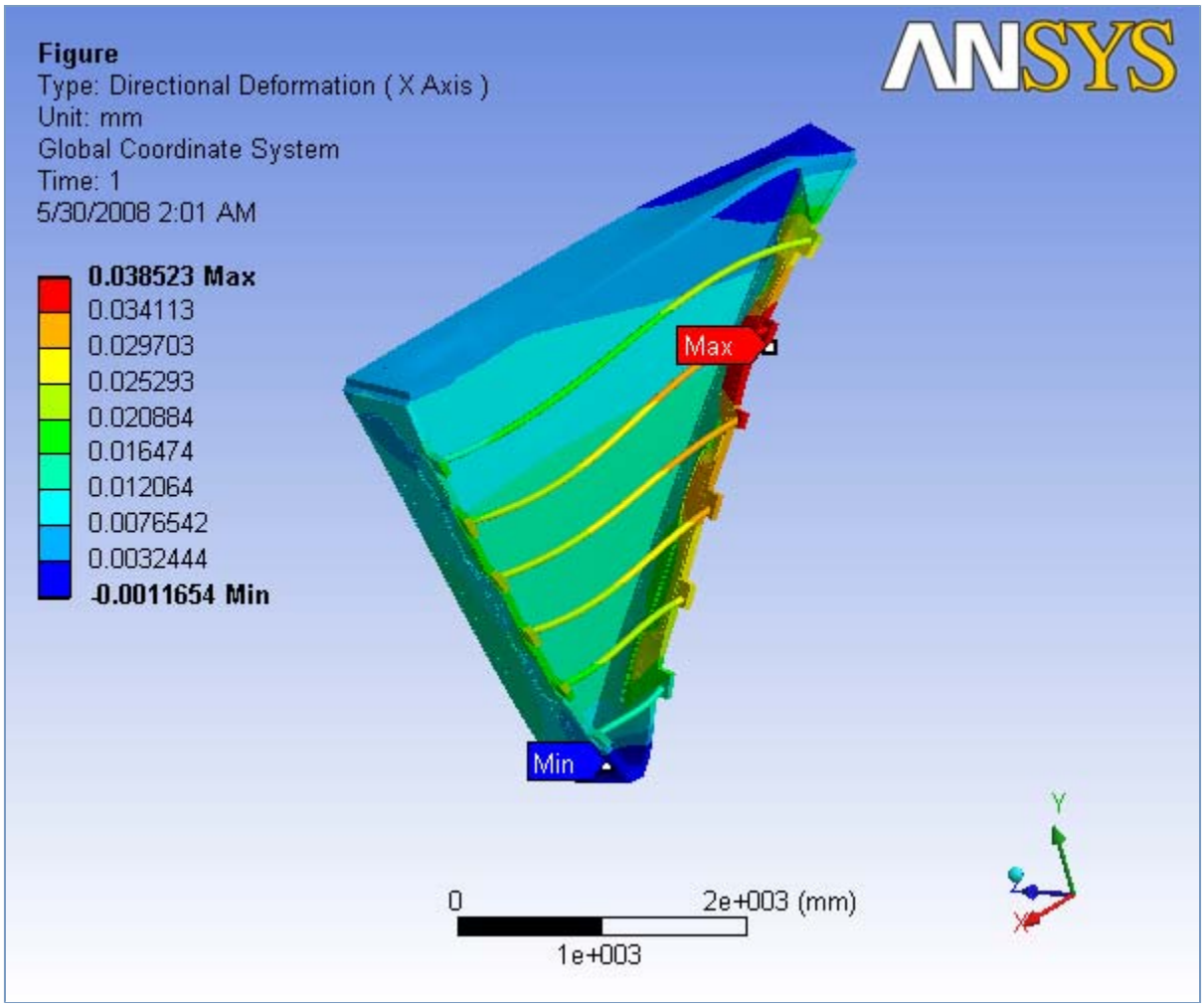


FIGURE 12
sector 1, Case 2 > Static Structural > Solution > Y - Directional Deformation > Figure

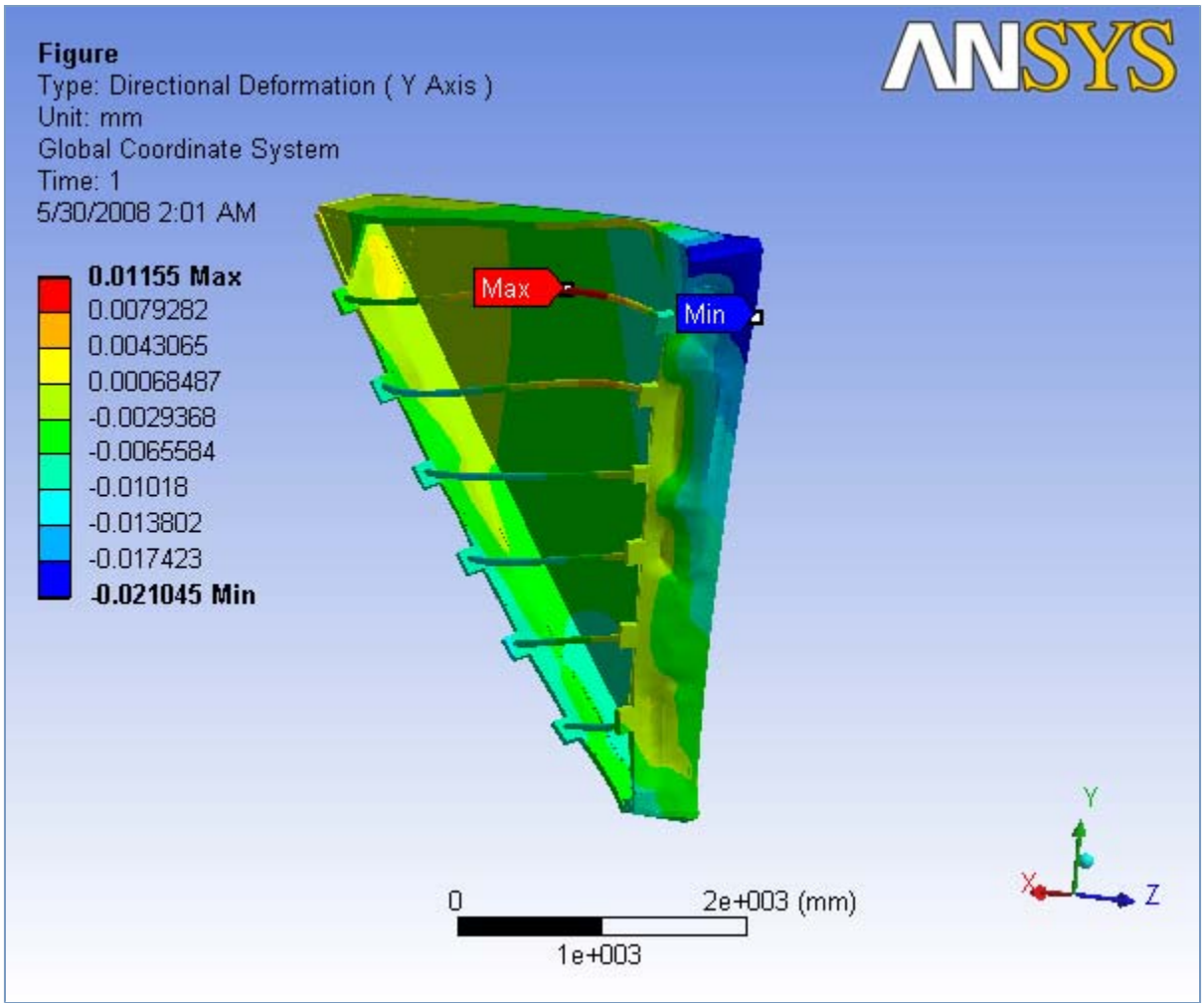


FIGURE 13
sector 1, Case 2 > Static Structural > Solution > Z - Directional Deformation > Figure

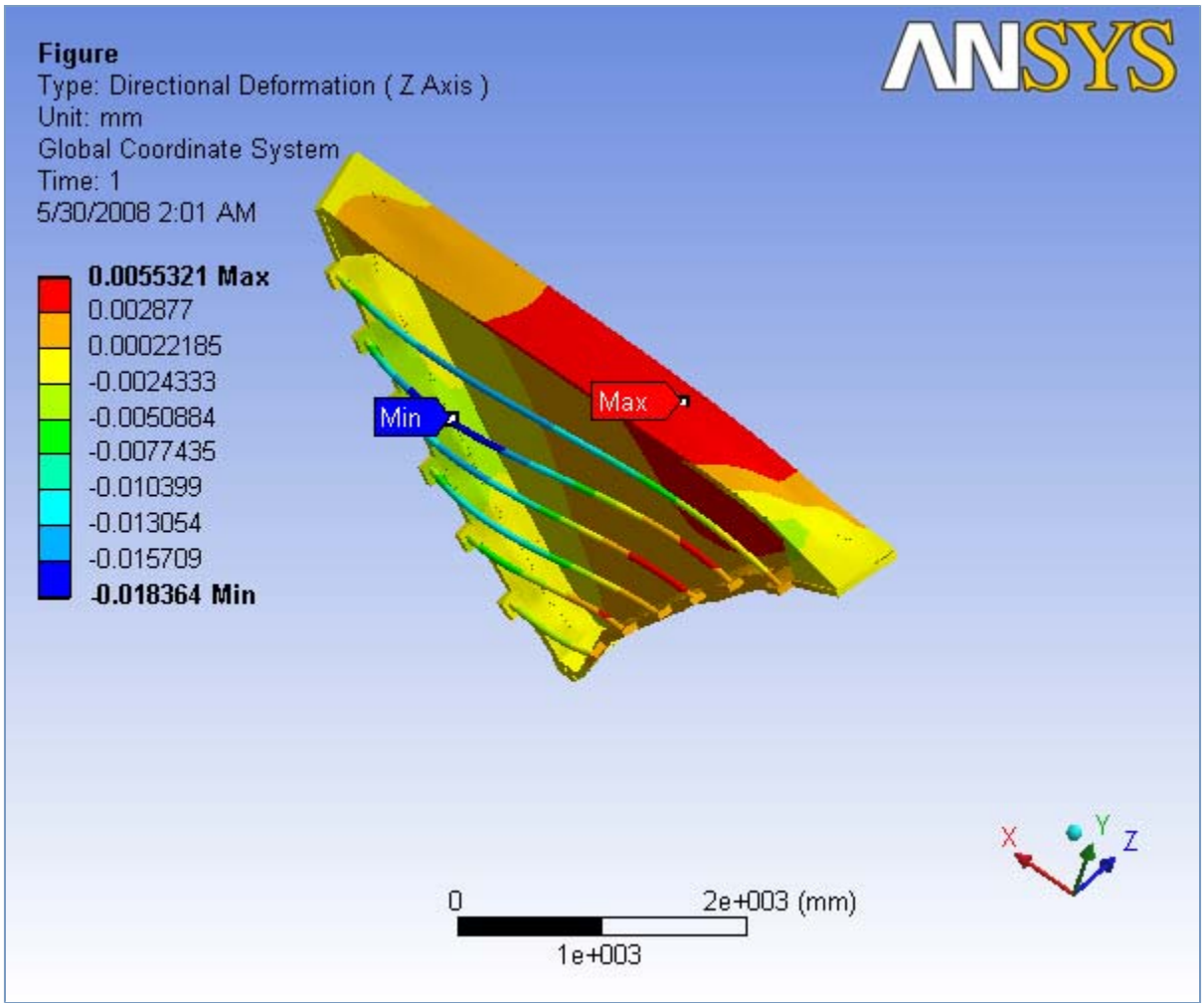


FIGURE 14
sector 1, Case 2 > Static Structural > Solution > Equivalent Stress > Figure

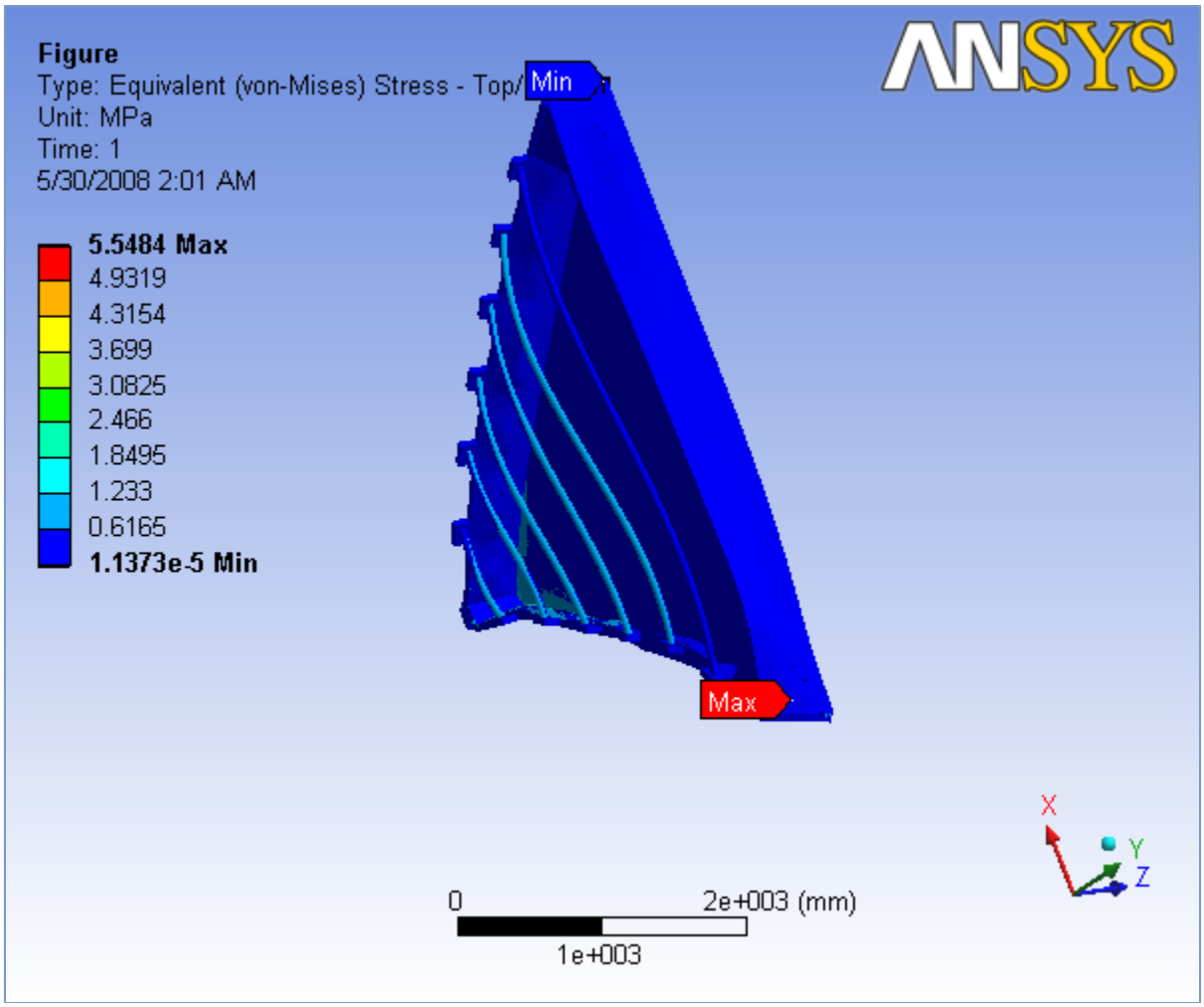
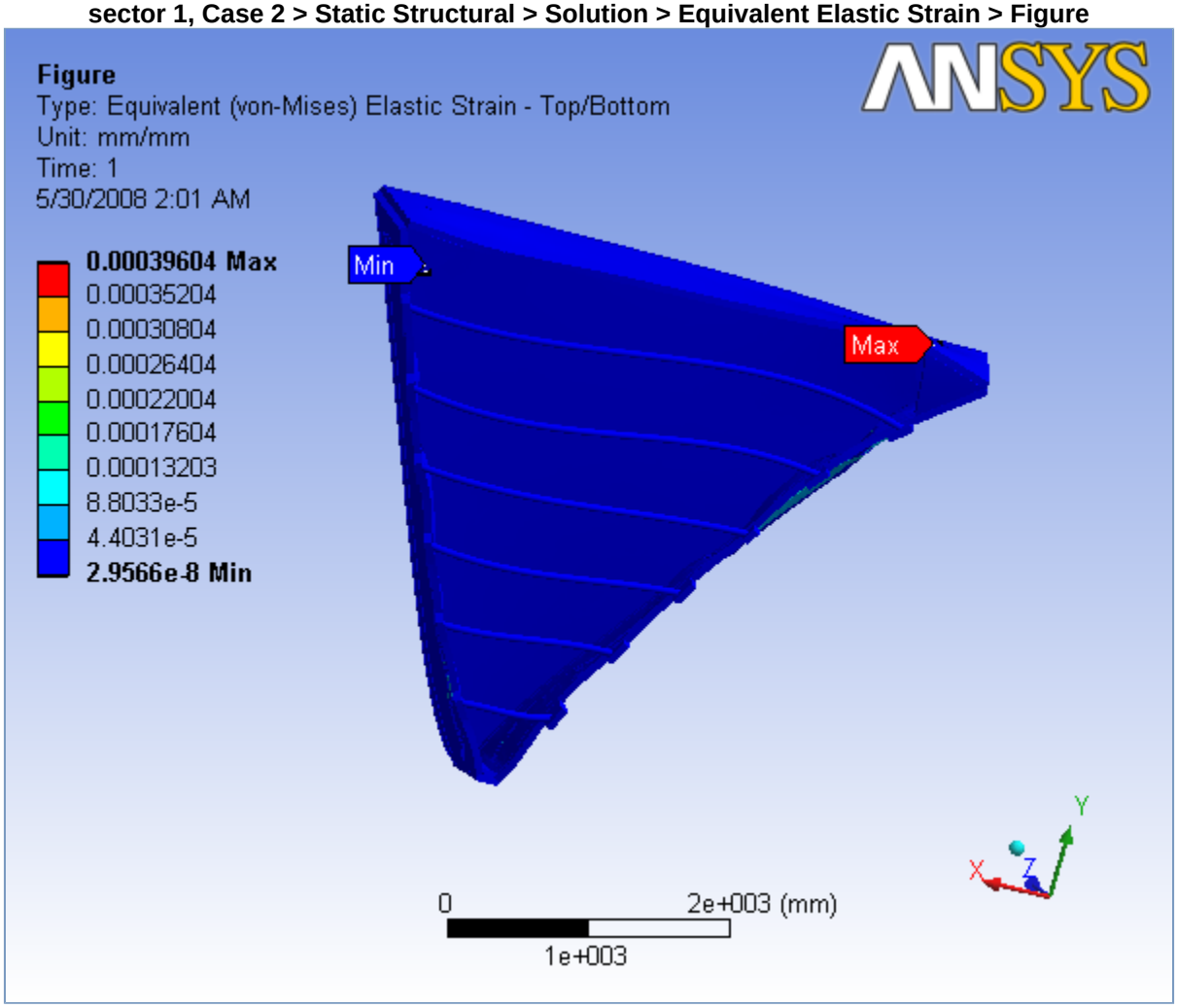


TABLE 65
sector 1, Case 2 > Static Structural > Solution > Results

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	2.9566e-008 mm/mm
Maximum	3.9604e-004 mm/mm
Minimum Occurs On	Left Front Triangular Constraint
Maximum Occurs On	Back Plate Polyurethane
Information	
Time	1. s
Load Step	1
Substep	1
Iteration Number	1

FIGURE 15

sector 1, Case 2 > Static Structural > Solution > Equivalent Elastic Strain > Figure



Material Data

Aluminum

TABLE 66
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 67
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

Stainless steel

TABLE 68
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

Carbon fiber

TABLE 69
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

Structural Steel

TABLE 70
Structural Steel > Constants

Structural	

Young's Modulus	2.e+005 MPa
Poisson's Ratio	0.3
Density	7.85e-006 kg/mm³
Thermal Expansion	1.2e-005 1/°C
Tensile Yield Strength	250. MPa
Compressive Yield Strength	250. MPa
Tensile Ultimate Strength	460. MPa
Compressive Ultimate Strength	0. MPa
Thermal	
Thermal Conductivity	6.05e-002 W/mm·°C
Specific Heat	434. J/kg·°C
Electromagnetics	
Relative Permeability	10000
Resistivity	1.7e-004 Ohm·mm

FIGURE 16
Structural Steel > Alternating Stress

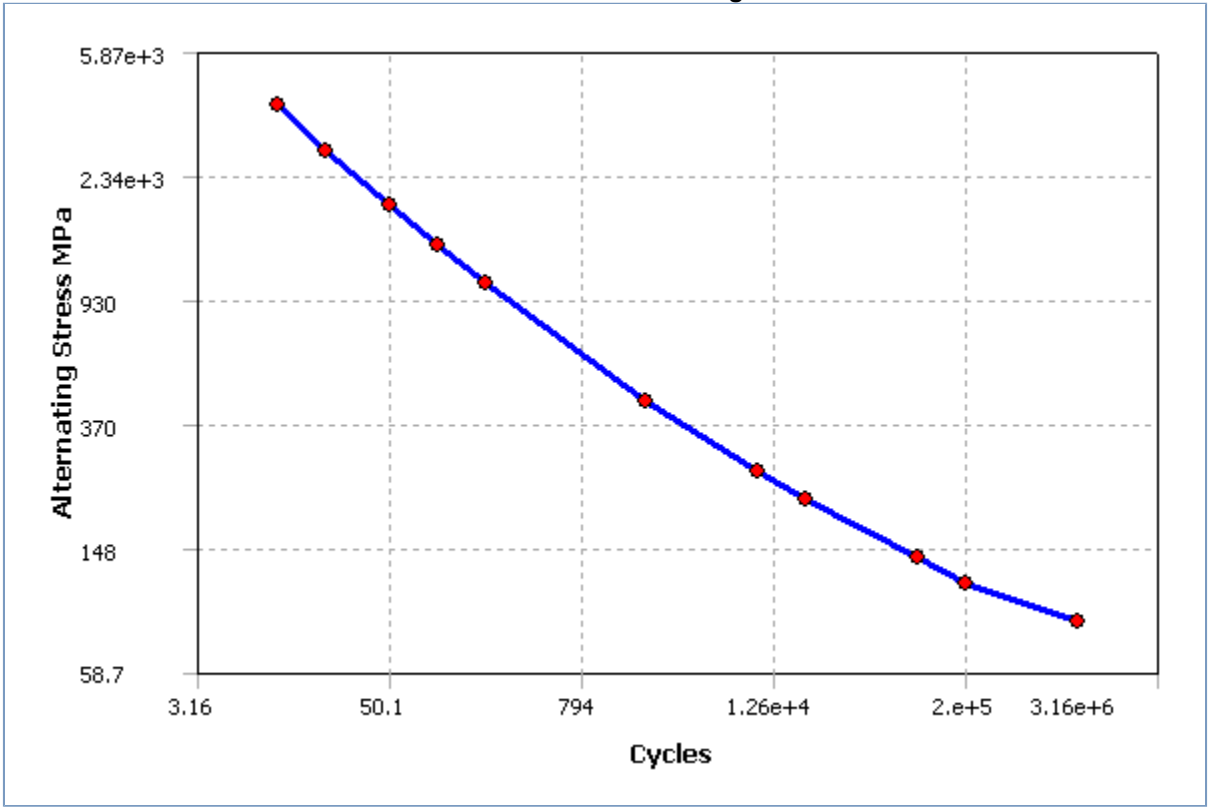


TABLE 71
Structural Steel > Alternating Stress > Property Attributes

Interpolation	Log-Log
Mean Curve Type	Mean Stress

TABLE 72
Structural Steel > Alternating Stress > Alternating Stress Curve Data

Mean Value MPa
0.

TABLE 73

Structural Steel > Alternating Stress > Alternating Stress vs. Cycles

Cycles	Alternating Stress MPa
10.	3999.
20.	2827.
50.	1896.
100.	1413.
200.	1069.
2000.	441.
10000	262.
20000	214.
1.e+005	138.
2.e+005	114.
1.e+006	86.2

FIGURE 17
Structural Steel > Strain-Life Parameters

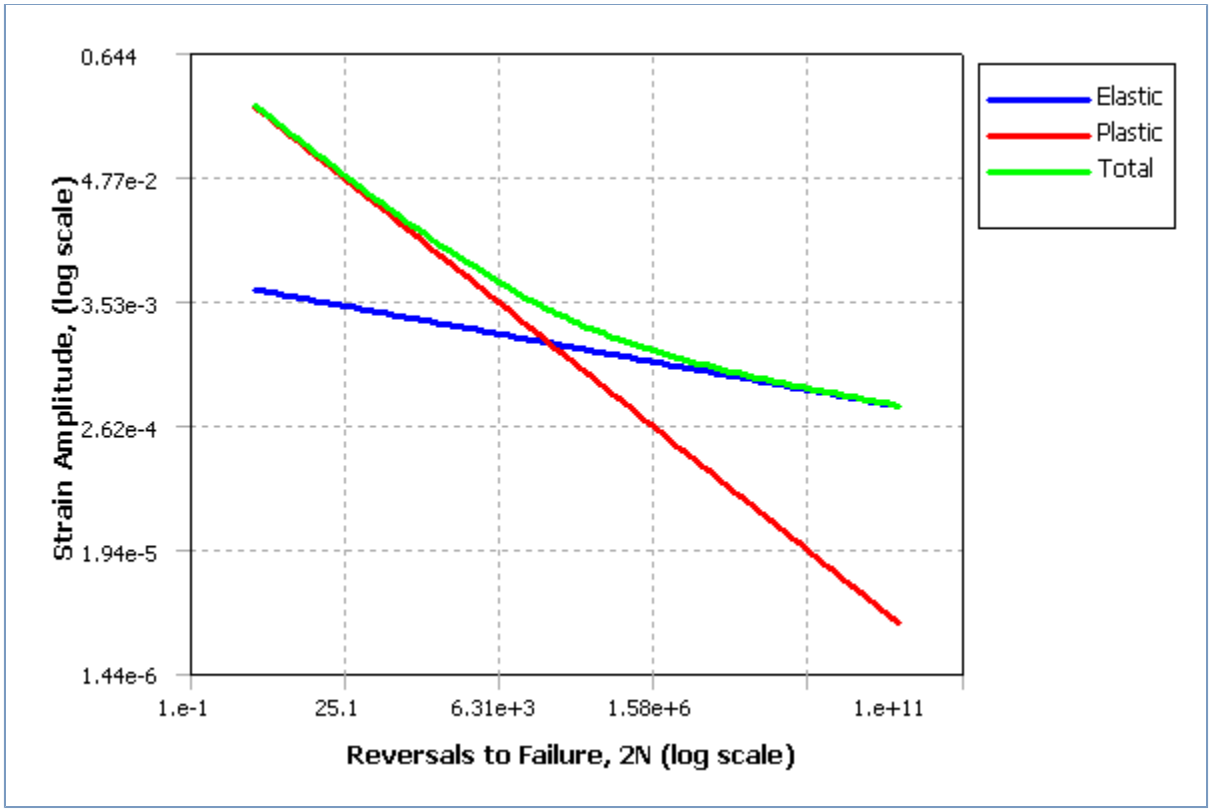


TABLE 74
Structural Steel > Strain-Life Parameters > Property Attributes

Display Curve Type	Strain-Life

TABLE 75
Structural Steel > Strain-Life Parameters > Strain-Life Parameters

Strength Coefficient MPa	920.
Strength Exponent	-0.106
Ductility Coefficient	0.213
Ductility Exponent	-0.47
Cyclic Strength Coefficient MPa	1000.
Cyclic Strain Hardening Exponent	0.2