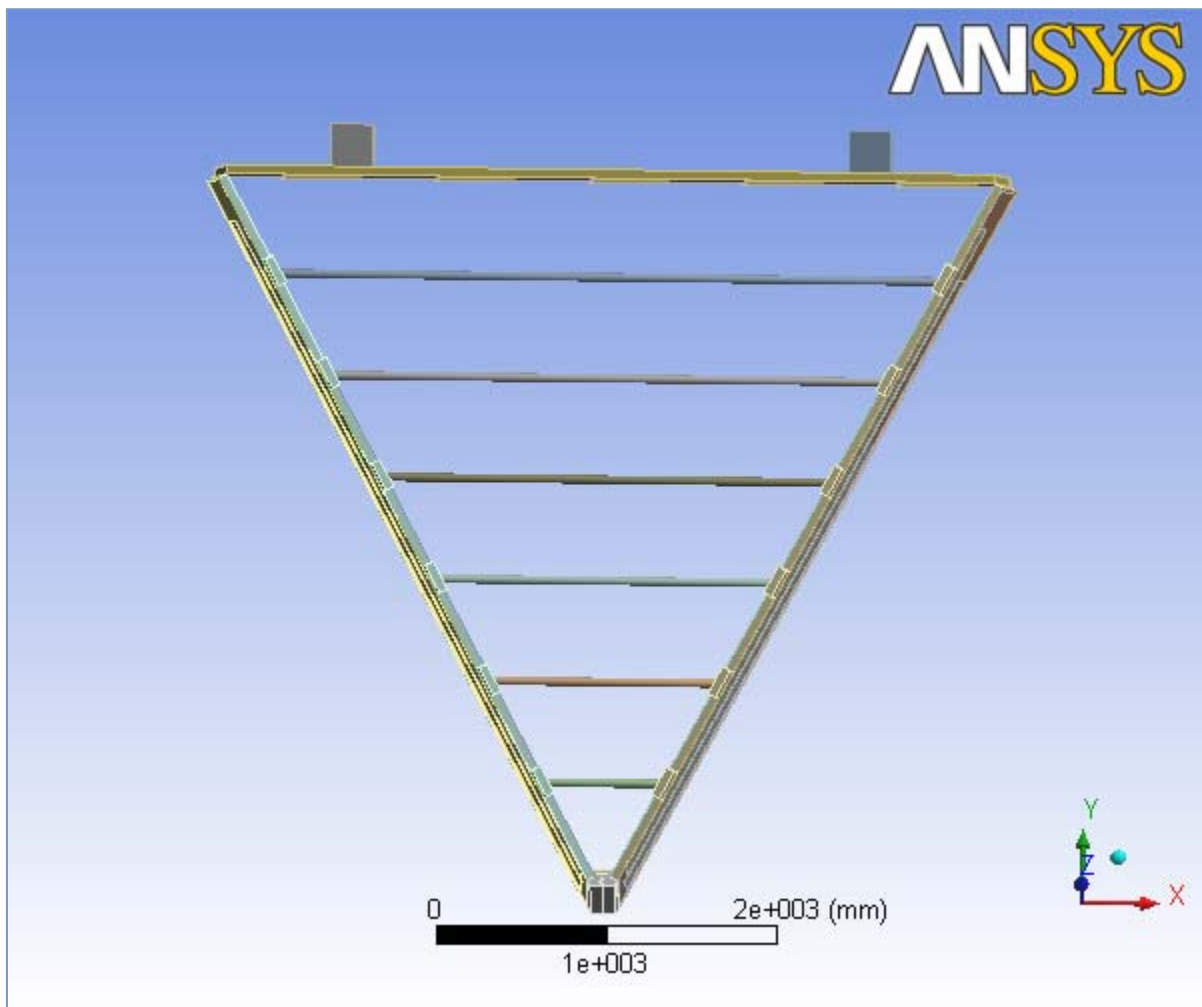




## Analysis 2.3

|                        |  |
|------------------------|--|
| <i>Author</i>          | <i>Kalyan Jinnuri</i>  |
| <i>Subject</i>         | <i>Ideal Case with Gravity, Wire Tensions and Rods( 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, Wire Tensions and Rods, No Hexcel, No Mylar

### Geometry

**TABLE 2**

**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Geometry**

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

|                                   |          |
|-----------------------------------|----------|
| Mass                              | 331.4 kg |
| <b>Statistics</b>                 |          |
| Bodies                            | 28       |
| Active Bodies                     | 28       |
| Nodes                             | 156969   |
| Elements                          | 24894    |
| <b>Preferences</b>                |          |
| 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, Wire Tensions and Rods, No Hexcel, No Mylar > Geometry > Parts**

| Object Name                | <i>Nose Plate</i>           | <i>Left Endplate<br/>Downstream Hole<br/>area</i> | <i>Right Endplate<br/>Upstream Hole<br/>area</i> | <i>Left Endplate<br/>Upstream Hole<br/>area</i> | <i>Left Endplate<br/>Aluminum Casing</i> |
|----------------------------|-----------------------------|---|--|---|--|
| State                      | Meshed                      |   |  |   |  |
| <b>Graphics Properties</b> |                             |   |  |   |  |
| Visible                    | Yes                         |   |  |   |  |
| Transparency               | 1                           |   |  |   |  |
| <b>Definition</b>          |                             |   |  |   |  |
| Suppressed                 | No                          |   |  |   |  |
| Material                   | Aluminum                    | Polyurethane                                      |  |   | Aluminum                                 |
| Stiffness Behavior         | Flexible                    |   |  |   |  |
| Nonlinear Material Effects | Yes                         |   |  |   |  |
| <b>Bounding Box</b>        |                             |   |  |   |  |
| 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                                |
| <b>Properties</b>          |                             |   |  |   |  |
| Volume                     | 6.6319e+006 mm <sup>3</sup> | 4.3107e+007 mm <sup>3</sup>                       | 4.1332e+007 mm <sup>3</sup>                      | 3.8462e+007 mm <sup>3</sup>                     | 1.1673e+007 mm <sup>3</sup>              |
| 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 <sup>2</sup> | 1.68e+007 kg·mm <sup>2</sup>  | 1.5457e+007 kg·mm <sup>2</sup> | 1.2459e+007 kg·mm <sup>2</sup> | 5.6821e+007 kg·mm <sup>2</sup> |
| Moment of Inertia Ip2 | 4.4442e+005 kg·mm <sup>2</sup> | 34145 kg·mm <sup>2</sup>      | 31455 kg·mm <sup>2</sup>       | 29271 kg·mm <sup>2</sup>       | 1.6143e+006 kg·mm <sup>2</sup> |
| Moment of Inertia Ip3 | 43603 kg·mm <sup>2</sup>       | 1.677e+007 kg·mm <sup>2</sup> | 1.543e+007 kg·mm <sup>2</sup>  | 1.2434e+007 kg·mm <sup>2</sup> | 5.5221e+007 kg·mm <sup>2</sup> |
| <b>Statistics</b>     |                                |                               |                                |                                |                                |
| Nodes                 | 440                            | 296                           | 272                            | 2445                           |                                |
| Elements              | 179                            | 24                            | 22                             | 926                            |                                |

**TABLE 4**  
**Ideal Slice with Gravity, Wire Tensions and Rods, 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                            |  |                                       |                                    |  |
| <b>Graphics Properties</b> |                                   |  |                                       |                                    |  |
| Visible                    | Yes                               |  |                                       |                                    |  |
| Transparency               | 1                                 |  |                                       |                                    |  |
| <b>Definition</b>          |                                   |  |                                       |                                    |  |
| Suppressed                 | No                                |  |                                       |                                    |  |
| Material                   | Polyurethane                      |  | Aluminum                              | Polyurethane                       | Stainless Steel                        |
| Stiffness Behavior         | Flexible                          |  |                                       |                                    |  |
| Nonlinear Material Effects | Yes                               |  |                                       |                                    |  |
| Thickness                  | 1.2192 mm                         |  |                                       |                                    |  |
| Thickness Mode             | Manual                            |  |                                       |                                    |  |
| <b>Bounding Box</b>        |                                   |  |                                       |                                    |  |
| 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                              |
| <b>Properties</b>          |                                   |  |                                       |                                    |  |
| Volume                     | 3.4557e+007 mm <sup>3</sup>       | 3.9784e+007 mm <sup>3</sup>                | 1.1919e+007 mm <sup>3</sup>           | 3.4764e+007 mm <sup>3</sup>        | 2.9149e+006 mm <sup>3</sup>            |
| 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 <sup>2</sup>    | 1.321e+007 kg·mm <sup>2</sup>              | 6.0236e+007 kg·mm <sup>2</sup>        | 2.1346e+007 kg·mm <sup>2</sup>     |  |
| Moment of Inertia Ip2      | 2.0417e+005 kg·mm <sup>2</sup>    | 31513 kg·mm <sup>2</sup>                   | 1.6548e+006 kg·mm <sup>2</sup>        | 1.8581e+005 kg·mm <sup>2</sup>     |  |
| Moment of Inertia Ip3      | 2.076e+007 kg·mm <sup>2</sup>     | 1.3183e+007 kg·mm <sup>2</sup>             | 5.8594e+007 kg·mm <sup>2</sup>        | 2.1163e+007 kg·mm <sup>2</sup>     |  |
| Surface Area (approx.)     | 2.3908e+006 mm <sup>2</sup>       |  |                                       |                                    |  |
| <b>Statistics</b>          |                                   |  |                                       |                                    |  |
| Nodes                      | 1862                              | 272  | 2379                                  | 1843                               | 168                                    |
| Elements                   | 639                               | 22   | 905                                   | 627                                | 124                                    |

**TABLE 5**

**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Geometry > Parts**

| Object Name                | <i>Left Endplate<br/>Outer Steel slice</i> | <i>Right Endplate<br/>Outer Steel slice</i> | <i>Right Endplate<br/>Inner Steel Slice</i> | <i>Backplate<br/>Aluminum Casing</i> | <i>Backplate<br/>Polyurethane</i> |
|----------------------------|--|---|---|--------------------------------------|-----------------------------------|
| State                      | Meshed                                     |   |   |                                      |                                   |
| <b>Graphics Properties</b> |  |   |   |                                      |                                   |
| Visible                    | Yes  |   |   |                                      |                                   |
| Transparency               | 1  |   |   |                                      |                                   |
| <b>Definition</b>          |  |   |   |                                      |                                   |
| Suppressed                 | No   |   |   |                                      |                                   |
| Material                   | Stainless Steel                            |   |   | Aluminum                             | Polyurethane                      |
| Nonlinear Material Effects | Yes  |   |   |                                      |                                   |
| Thickness                  | 1.2192 mm                                  |   |   |                                      |                                   |
| Thickness Mode             | Manual                                     |   |   |                                      |                                   |
| Stiffness Behavior         |  |   |   | Flexible                             |                                   |
| <b>Bounding Box</b>        |  |   |   |                                      |                                   |
| 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                         |
| <b>Properties</b>          |  |   |   |                                      |                                   |
| Volume                     | 2.9149e+006 mm <sup>3</sup>                |   |   | 5.2863e+006 mm <sup>3</sup>          | 1.1124e+008 mm <sup>3</sup>       |
| Mass                       | 23.319 kg                                  |   |   | 14.273 kg                            | 26.698 kg                         |
| Surface Area (approx.)     | 2.3908e+006 mm <sup>2</sup>                |   |   |                                      |                                   |
| 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 <sup>2</sup>       | 5.1362e+005 kg·mm <sup>2</sup>    |
| Moment of Inertia Ip2      |  |   |   | 3.0219e+007 kg·mm <sup>2</sup>       | 4.725e+007 kg·mm <sup>2</sup>     |
| Moment of Inertia Ip3      |  |   |   | 2.9438e+007 kg·mm <sup>2</sup>       | 4.6748e+007 kg·mm <sup>2</sup>    |
| <b>Statistics</b>          |  |   |   |                                      |                                   |
| Nodes                      | 176  | 157   | 155   | 708                                  | 241                               |
| Elements                   | 132  | 113   | 111   | 74                                   | 24                                |

**TABLE 6**

**Ideal Slice with Gravity, Wire Tensions and Rods, 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       |              |              |              |              |
| <b>Graphics Properties</b> |              |              |              |              |              |
| Visible                    | Yes          |              |              |              |              |
| Transparency               | 1            |              |              |              |              |
| <b>Definition</b>          |              |              |              |              |              |
| Suppressed                 | No           |              |              |              |              |
| Material                   | Carbon fiber |              |              |              |              |
| Stiffness Behavior         | Flexible     |              |              |              |              |
| Nonlinear Material Effects | Yes          |              |              |              |              |

| <b>Bounding Box</b>   |                                |                                |                                |                             |                            |
|-----------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------------|----------------------------|
| 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                        |                                |                                |                             |                            |
| <b>Properties</b>     |                                |                                |                                |                             |                            |
| Volume                | 5.1151e+005 mm <sup>3</sup>    | 6.3841e+005 mm <sup>3</sup>    | 7.6532e+005 mm <sup>3</sup>    | 1.3079e+005 mm <sup>3</sup> | 2.577e+005 mm <sup>3</sup> |
| 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 <sup>2</sup>      | 221.97 kg·mm <sup>2</sup>      | 266.09 kg·mm <sup>2</sup>      | 45.457 kg·mm <sup>2</sup>   | 89.595 kg·mm <sup>2</sup>  |
| Moment of Inertia Ip2 | 1.6387e+005 kg·mm <sup>2</sup> | 3.1853e+005 kg·mm <sup>2</sup> | 5.4867e+005 kg·mm <sup>2</sup> | 2768.1 kg·mm <sup>2</sup>   | 21001 kg·mm <sup>2</sup>   |
| Moment of Inertia Ip3 | 1.6388e+005 kg·mm <sup>2</sup> | 3.1853e+005 kg·mm <sup>2</sup> | 5.4867e+005 kg·mm <sup>2</sup> | 2768.2 kg·mm <sup>2</sup>   | 21001 kg·mm <sup>2</sup>   |
| <b>Statistics</b>     |                                |                                |                                |                             |                            |
| Nodes                 | 27520                          | 34352                          | 41184                          | 11946                       | 7788                       |
| Elements              | 3920                           | 4896                           | 5872                           | 1760                        | 1104                       |

**TABLE 7****Ideal Slice with Gravity, Wire Tensions and Rods, 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                     |                                |                                |                                |                                |
| <b>Graphics Properties</b> |                            |                                |                                |                                |                                |
| Visible                    | Yes                        |                                |                                |                                |                                |
| Transparency               | 1                          |                                |                                |                                |                                |
| <b>Definition</b>          |                            |                                |                                |                                |                                |
| Suppressed                 | No                         |                                |                                |                                |                                |
| Material                   | Carbon fiber               | Polyurethane                   |                                |                                |                                |
| Stiffness Behavior         | Flexible                   |                                |                                |                                |                                |
| Nonlinear Material Effects | Yes                        |                                |                                |                                |                                |
| <b>Bounding Box</b>        |                            |                                |                                |                                |                                |
| 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                      |
| <b>Properties</b>          |                            |                                |                                |                                |                                |
| Volume                     | 3.846e+005 mm <sup>3</sup> | 643.76 mm <sup>3</sup>         | 535.05 mm <sup>3</sup>         | 584.49 mm <sup>3</sup>         | 2.9863e+007 mm <sup>3</sup>    |
| 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 <sup>2</sup>  | 4.3804e-004 kg·mm <sup>2</sup> | 3.1967e-003 kg·mm <sup>2</sup> | 1.0045e-003 kg·mm <sup>2</sup> | 1.7368e+005 kg·mm <sup>2</sup> |
| Moment of Inertia Ip2      | 69702 kg·mm <sup>2</sup>   | 3.1866e-002 kg·mm <sup>2</sup> | 8.6441e-004 kg·mm <sup>2</sup> | 3.7877e-003 kg·mm <sup>2</sup> | 1.7368e+005 kg·mm <sup>2</sup> |
| Moment of Inertia Ip3      | 69702 kg·mm <sup>2</sup>   | 3.1661e-002                    | 3.526e-003                     | 4.2077e-003                    | 74658 kg·mm <sup>2</sup>       |

|                   |       |                    |                    |                    |     |
|-------------------|-------|--------------------|--------------------|--------------------|-----|
|                   |       | kg-mm <sup>2</sup> | kg-mm <sup>2</sup> | kg-mm <sup>2</sup> |     |
| <b>Statistics</b> |       |                    |                    |                    |     |
| Nodes             | 20576 | 237                | 294                | 250                | 376 |
| Elements          | 2928  | 22                 | 38                 | 30                 | 54  |

**TABLE 8**  
**Ideal Slice with Gravity, Wire Tensions and Rods, 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                             |                                     |
| <b>Graphics Properties</b> |                                |                                    |                                     |
| Visible                    | Yes                            | No                                 |                                     |
| Transparency               | 1                              |                                    |                                     |
| <b>Definition</b>          |                                |                                    |                                     |
| Suppressed                 | No                             |                                    |                                     |
| Material                   | Polyurethane                   | Stainless Steel                    |                                     |
| Stiffness Behavior         | Flexible                       |                                    |                                     |
| Nonlinear Material Effects | Yes                            |                                    |                                     |
| Thickness                  |                                | 1.2192 mm                          |                                     |
| Thickness Mode             |                                | Manual                             |                                     |
| <b>Bounding Box</b>        |                                |                                    |                                     |
| Length X                   | 250.37 mm                      | 4524.4 mm                          |                                     |
| Length Y                   | 371.11 mm                      | 137.65 mm                          |                                     |
| Length Z                   | 528.13 mm                      | 484.52 mm                          |                                     |
| <b>Properties</b>          |                                |                                    |                                     |
| Volume                     | 2.9863e+007 mm <sup>3</sup>    | 2.7483e+006 mm <sup>3</sup>        |                                     |
| 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 <sup>2</sup> |                                    |                                     |
| Moment of Inertia Ip2      | 1.7368e+005 kg-mm <sup>2</sup> |                                    |                                     |
| Moment of Inertia Ip3      | 74658 kg-mm <sup>2</sup>       |                                    |                                     |
| Surface Area(approx.)      |                                | 2.2542e+006 mm <sup>2</sup>        |                                     |
| <b>Statistics</b>          |                                |                                    |                                     |
| Nodes                      | 376                            | 174                                | 186                                 |
| Elements                   | 54                             | 129                                | 141                                 |

### Connections

**TABLE 9**  
**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Connections**

|                            |                    |
|----------------------------|--------------------|
| Object Name                | <i>Connections</i> |
| State                      | Fully Defined      |
| <b>Auto Detection</b>      |                    |
| 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         |
| <b>Transparency</b> |             |
| Enabled             | Yes         |

**TABLE 10**

**Ideal Slice with Gravity, Wire Tensions and Rods, 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                 |                            |                                |                             |                                 |
| <b>Scope</b>        |                               |                            |                                |                             |                                 |
| 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 |
| <b>Definition</b>   |                               |                            |                                |                             |                                 |
| Type                | Bonded                        |                            |                                |                             |                                 |
| Scope Mode          | Automatic                     |                            |                                |                             |                                 |
| Behavior            | Symmetric                     |                            |                                |                             |                                 |
| Suppressed          | No                            |                            |                                |                             |                                 |
| <b>Advanced</b>     |                               |                            |                                |                             |                                 |
| Formulation         | Pure Penalty                  |                            |                                |                             |                                 |
| Normal Stiffness    | Program Controlled            |                            |                                |                             |                                 |
| Update Stiffness    | Never                         |                            |                                |                             |                                 |
| Thermal Conductance | Program Controlled            |                            |                                |                             |                                 |
| Pinball Region      | Program Controlled            |                            |                                |                             |                                 |

**TABLE 11**

**Ideal Slice with Gravity, Wire Tensions and Rods, 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                    |                  |                  |                                    |                            |
| <b>Scope</b>      |                                  |                  |                  |                                    |                            |
| 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 |
| <b>Definition</b> |                                  |                  |                  |                                    |                            |
| Type              | Bonded                           |                  |                  |                                    |                            |
| Scope Mode        | Automatic                        |                  |                  |                                    |                            |
| Behavior          | Symmetric                        |                  |                  |                                    |                            |
| Suppressed        | No                               |                  |                  |                                    |                            |



| <b>Advanced</b>     |                    |
|---------------------|--------------------|
| Formulation         | Pure Penalty       |
| Normal Stiffness    | Program Controlled |
| Update Stiffness    | Never              |
| Thermal Conductance | Program Controlled |
| Pinball Region      | Program Controlled |

**TABLE 12**

**Ideal Slice with Gravity, Wire Tensions and Rods, 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                      |                                 |                                   |                             |                                  |
| <b>Scope</b>        |                                    |                                 |                                   |                             |                                  |
| 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 |
| <b>Definition</b>   |                                    |                                 |                                   |                             |                                  |
| Type                | Bonded                             |                                 |                                   |                             |                                  |
| Scope Mode          | Automatic                          |                                 |                                   |                             |                                  |
| Behavior            | Symmetric                          |                                 |                                   |                             |                                  |
| Suppressed          | No                                 |                                 |                                   |                             |                                  |
| <b>Advanced</b>     |                                    |                                 |                                   |                             |                                  |
| Formulation         | Pure Penalty                       |                                 |                                   |                             |                                  |
| Normal Stiffness    | Program Controlled                 |                                 |                                   |                             |                                  |
| Update Stiffness    | Never                              |                                 |                                   |                             |                                  |
| Thermal Conductance | Program Controlled                 |                                 |                                   |                             |                                  |
| Pinball Region      | Program Controlled                 |                                 |                                   |                             |                                  |

**TABLE 13**

**Ideal Slice with Gravity, Wire Tensions and Rods, 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                     |                                  |                            |                                 |                                 |
| <b>Scope</b>      |                                   |                                  |                            |                                 |                                 |
| 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 |
| <b>Definition</b> |                                   |                                  |                            |                                 |                                 |
| Type              | Bonded                            |                                  |                            |                                 |                                 |
| Scope Mode        | Automatic                         |                                  |                            |                                 |                                 |
| Behavior          | Symmetric                         |                                  |                            |                                 |                                 |

|                     |                    |
|---------------------|--------------------|
| Suppressed          | No                 |
| <b>Advanced</b>     |                    |
| Formulation         | Pure Penalty       |
| Normal Stiffness    | Program Controlled |
| Update Stiffness    | Never              |
| Thermal Conductance | Program Controlled |
| Pinball Region      | Program Controlled |

**TABLE 14**

**Ideal Slice with Gravity, Wire Tensions and Rods, 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                 |                                 |                                 |                          |                          |
| <b>Scope</b>        |                               |                                 |                                 |                          |                          |
| 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                    |
| <b>Definition</b>   |                               |                                 |                                 |                          |                          |
| Type                | Bonded                        |                                 |                                 |                          |                          |
| Scope Mode          | Automatic                     |                                 |                                 |                          |                          |
| Behavior            | Symmetric                     |                                 |                                 |                          |                          |
| Suppressed          | No                            |                                 |                                 |                          |                          |
| <b>Advanced</b>     |                               |                                 |                                 |                          |                          |
| Formulation         | Pure Penalty                  |                                 |                                 |                          |                          |
| Normal Stiffness    | Program Controlled            |                                 |                                 |                          |                          |
| Update Stiffness    | Never                         |                                 |                                 |                          |                          |
| Thermal Conductance | Program Controlled            |                                 |                                 |                          |                          |
| Pinball Region      | Program Controlled            |                                 |                                 |                          |                          |

**TABLE 15**

**Ideal Slice with Gravity, Wire Tensions and Rods, 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                 |                          |                          |                          |                                 |
| <b>Scope</b>      |                               |                          |                          |                          |                                 |
| 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 |
| <b>Definition</b> |                               |                          |                          |                          |                                 |
| Type              | Bonded                        |                          |                          |                          |                                 |
| Scope Mode        | Automatic                     |                          |                          |                          |                                 |
| Behavior          | Symmetric                     |                          |                          |                          |                                 |
| Suppressed        | No                            |                          |                          |                          |                                 |

| <b>Advanced</b>     |                    |
|---------------------|--------------------|
| Formulation         | Pure Penalty       |
| Normal Stiffness    | Program Controlled |
| Update Stiffness    | Never              |
| Thermal Conductance | Program Controlled |
| Pinball Region      | Program Controlled |

**TABLE 16****Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Connections > Contact Regions**

| Object Name         | <i>Contact Region 31</i>        | <i>Contact Region 32</i>            | <i>Contact Region 33</i>         | <i>Contact Region 34</i>         | <i>Contact Region 35</i>       |
|---------------------|---------------------------------|-------------------------------------|----------------------------------|----------------------------------|--------------------------------|
| State               | Fully Defined                   |                                     |                                  |                                  |                                |
| <b>Scope</b>        |                                 |                                     |                                  |                                  |                                |
| 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    |
| <b>Definition</b>   |                                 |                                     |                                  |                                  |                                |
| Type                | Bonded                          |                                     |                                  |                                  |                                |
| Scope Mode          | Automatic                       |                                     |                                  |                                  |                                |
| Behavior            | Symmetric                       |                                     |                                  |                                  |                                |
| Suppressed          | No                              |                                     |                                  |                                  |                                |
| <b>Advanced</b>     |                                 |                                     |                                  |                                  |                                |
| Formulation         | Pure Penalty                    |                                     |                                  |                                  |                                |
| Normal Stiffness    | Program Controlled              |                                     |                                  |                                  |                                |
| Update Stiffness    | Never                           |                                     |                                  |                                  |                                |
| Thermal Conductance | Program Controlled              |                                     |                                  |                                  |                                |
| Pinball Region      | Program Controlled              |                                     |                                  |                                  |                                |

**TABLE 17****Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Connections > Contact Regions**

| Object Name       | <i>Contact Region 36</i>         | <i>Contact Region 37</i>         | <i>Contact Region 38</i> | <i>Contact Region 39</i> | <i>Contact Region 40</i> |
|-------------------|----------------------------------|----------------------------------|--------------------------|--------------------------|--------------------------|
| State             | Fully Defined                    |                                  |                          |                          |                          |
| <b>Scope</b>      |                                  |                                  |                          |                          |                          |
| 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                    |
| <b>Definition</b> |                                  |                                  |                          |                          |                          |
| Type              | Bonded                           |                                  |                          |                          |                          |
| Scope Mode        | Automatic                        |                                  |                          |                          |                          |

|                     |                    |
|---------------------|--------------------|
| Behavior            | Symmetric          |
| Suppressed          | No                 |
| <b>Advanced</b>     |                    |
| Formulation         | Pure Penalty       |
| Normal Stiffness    | Program Controlled |
| Update Stiffness    | Never              |
| Thermal Conductance | Program Controlled |
| Pinball Region      | Program Controlled |

**TABLE 18****Ideal Slice with Gravity, Wire Tensions and Rods, 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                  |                   |                   |                                  |                                  |
| <b>Scope</b>        |                                |                   |                   |                                  |                                  |
| 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 |
| <b>Definition</b>   |                                |                   |                   |                                  |                                  |
| Type                | Bonded                         |                   |                   |                                  |                                  |
| Scope Mode          | Automatic                      |                   |                   |                                  |                                  |
| Behavior            | Symmetric                      |                   |                   |                                  |                                  |
| Suppressed          | No                             |                   |                   |                                  |                                  |
| <b>Advanced</b>     |                                |                   |                   |                                  |                                  |
| Formulation         | Pure Penalty                   |                   |                   |                                  |                                  |
| Normal Stiffness    | Program Controlled             |                   |                   |                                  |                                  |
| Update Stiffness    | Never                          |                   |                   |                                  |                                  |
| Thermal Conductance | Program Controlled             |                   |                   |                                  |                                  |
| Pinball Region      | Program Controlled             |                   |                   |                                  |                                  |

**TABLE 19****Ideal Slice with Gravity, Wire Tensions and Rods, 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             |                   |                   |                        |                   |
| <b>Scope</b>      |                           |                   |                   |                        |                   |
| 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       |
| <b>Definition</b> |                           |                   |                   |                        |                   |
| Type              | Bonded                    |                   |                   |                        |                   |
| Scope Mode        | Automatic                 |                   |                   |                        |                   |
| Behavior          | Symmetric                 |                   |                   |                        |                   |
| Suppressed        | No                        |                   |                   |                        |                   |

| <b>Advanced</b>     |                    |
|---------------------|--------------------|
| Formulation         | Pure Penalty       |
| Normal Stiffness    | Program Controlled |
| Update Stiffness    | Never              |
| Thermal Conductance | Program Controlled |
| Pinball Region      | Program Controlled |

**TABLE 20**

**Ideal Slice with Gravity, Wire Tensions and Rods, 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               |                              |                             |                              |                             |
| <b>Scope</b>        |                             |                              |                             |                              |                             |
| 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 |
| <b>Definition</b>   |                             |                              |                             |                              |                             |
| Type                | Bonded                      |                              |                             |                              |                             |
| Scope Mode          | Automatic                   |                              |                             |                              |                             |
| Behavior            | Symmetric                   |                              |                             |                              |                             |
| Suppressed          | No                          |                              |                             |                              |                             |
| <b>Advanced</b>     |                             |                              |                             |                              |                             |
| Formulation         | Pure Penalty                |                              |                             |                              |                             |
| Normal Stiffness    | Program Controlled          |                              |                             |                              |                             |
| Update Stiffness    | Never                       |                              |                             |                              |                             |
| Thermal Conductance | Program Controlled          |                              |                             |                              |                             |
| Pinball Region      | Program Controlled          |                              |                             |                              |                             |

**TABLE 21**

**Ideal Slice with Gravity, Wire Tensions and Rods, 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               |  |   |  |   |
| <b>Scope</b>      |                             |  |   |  |   |
| 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   |   |
| <b>Definition</b> |                             |  |   |  |   |
| Type              | Bonded                      |  |   | No Separation  |   |

|                     |                    |           |
|---------------------|--------------------|-----------|
| Scope Mode          | Automatic          | Manual    |
| Behavior            | Symmetric          | Symmetric |
| Suppressed          | No                 |           |
| <b>Advanced</b>     |                    |           |
| 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, Wire Tensions and Rods, 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  |   |  |   |
| <b>Scope</b>        |  |   |  |   |
| 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  |
| <b>Definition</b>   |  |   |  |   |
| Type                | Bonded   |   |  |   |
| Scope Mode          | Manual   |   |  |   |
| Suppressed          | No   |   |  |   |
| <b>Advanced</b>     |  |   |  |   |
| 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, Wire Tensions and Rods, No Hexcel, No Mylar > Mesh**

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

| <b>Defaults</b>             |                     |
|-----------------------------|---------------------|
| Physics Preference          | Mechanical          |
| Relevance                   | -35                 |
| <b>Advanced</b>             |                     |
| 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                |
| <b>Statistics</b>           |                     |
| Nodes                       | 156969              |
| Elements                    | 24894               |

## Static Structural

**TABLE 24**  
Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Analysis

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

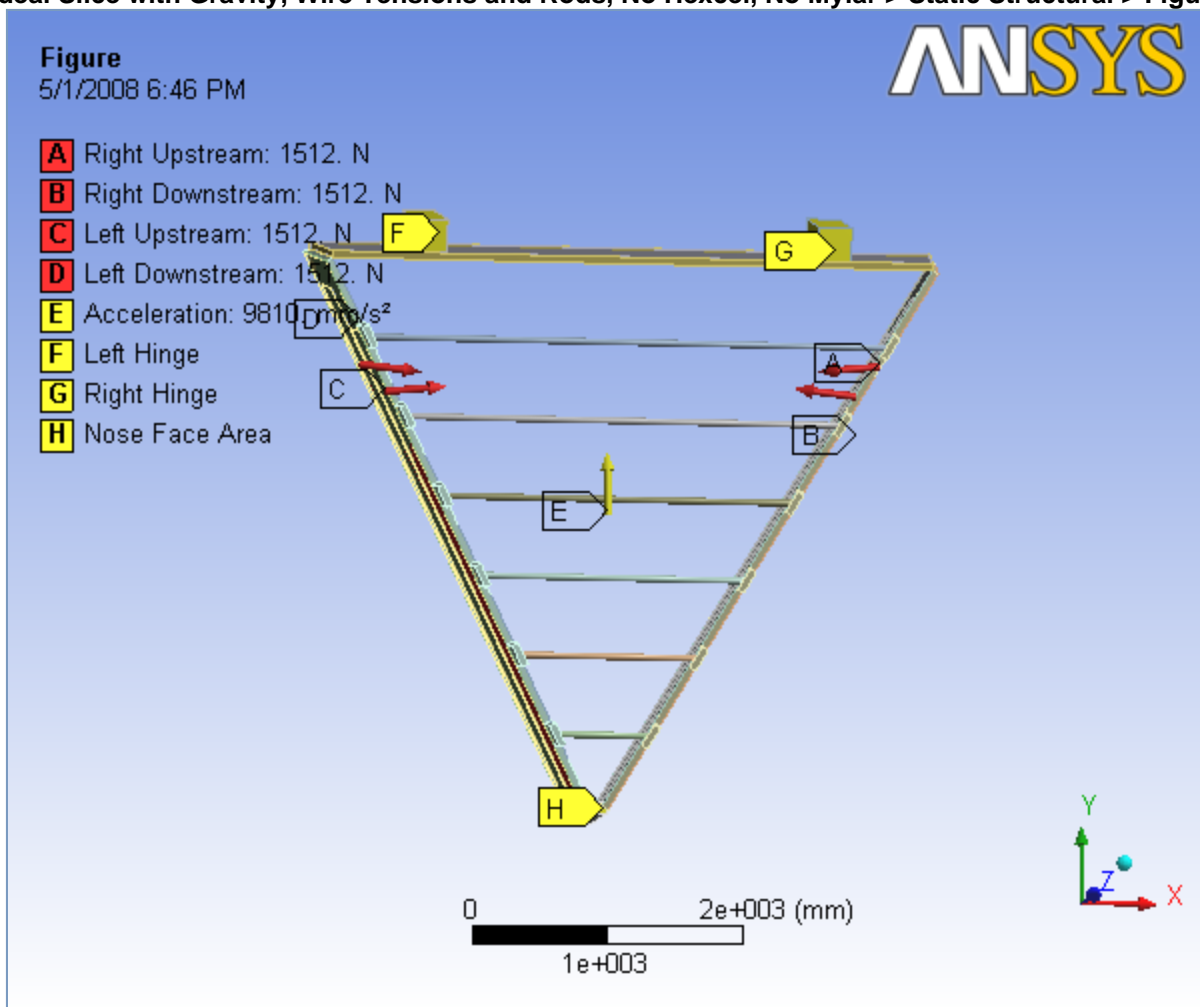
**TABLE 25**  
Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Analysis Settings

| Object Name               | <i>Analysis Settings</i> |
|---------------------------|--------------------------|
| State                     | Fully Defined            |
| <b>Step Controls</b>      |                          |
| Number Of Steps           | 1.                       |
| Current Step Number       | 1.                       |
| Step End Time             | 1. s                     |
| Auto Time Stepping        | Program Controlled       |
| <b>Solver Controls</b>    |                          |
| Solver Type               | Direct                   |
| Weak Springs              | Program Controlled       |
| Large Deflection          | Off                      |
| Inertia Relief            | Off                      |
| <b>Nonlinear Controls</b> |                          |
| Force Convergence         | Program Controlled       |
| Moment Convergence        | Program Controlled       |
| Displacement Convergence  | Program Controlled       |
| Rotation Convergence      | Program Controlled       |

|                                 |  |
|---------------------------------|--|
| Line Search                     | Program Controlled   |
| <b>Output Controls</b>          |  |
| Calculate Stress                | Yes  |
| Calculate Strain                | Yes  |
| Calculate Results At            | All Time Points  |
| <b>Analysis Data Management</b> |  |
| Solver Files Directory          | C:\Documents and Settings\Jinnuri\Desktop\website\AI slit\New Constraints\Analysis 2<br>\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, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Figure**



**TABLE 26**

**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Accelerations**

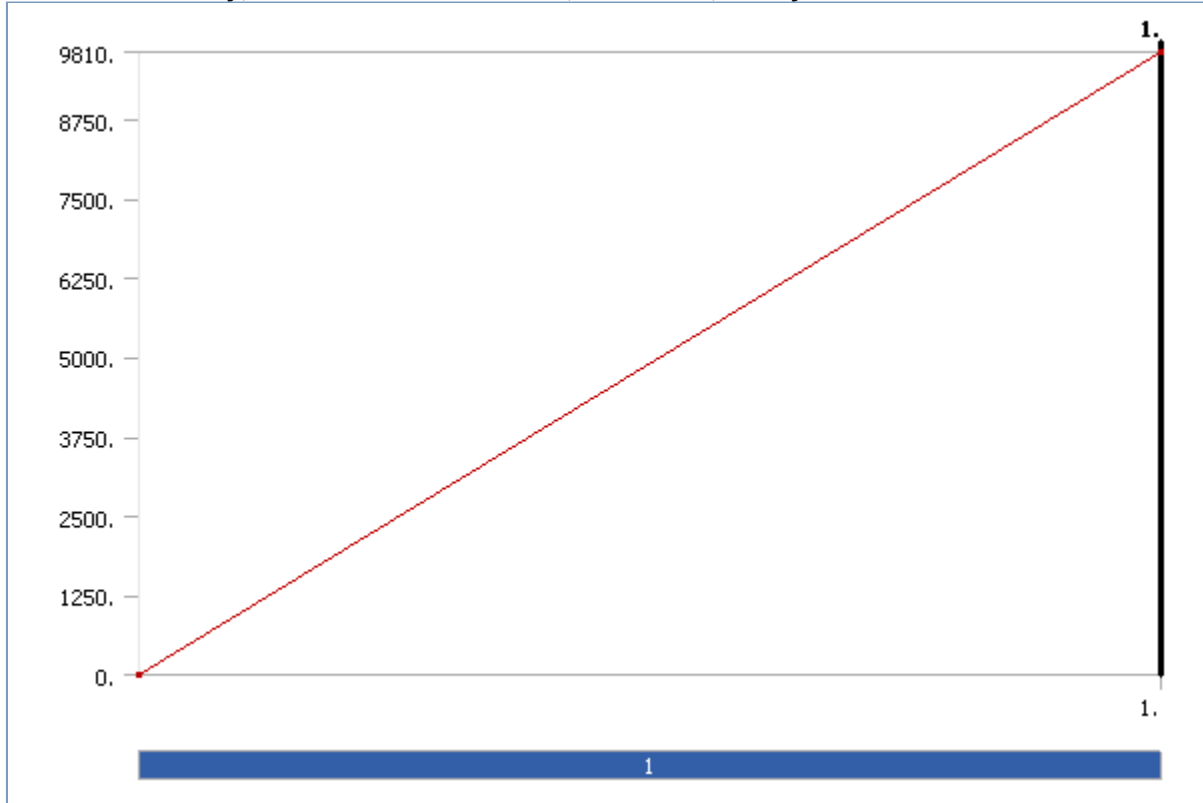
|              |                     |
|--------------|---------------------|
| Object Name  | <i>Acceleration</i> |
| State        | Fully Defined       |
| <b>Scope</b> |                     |
| Geometry     | All Bodies          |



| Definition |                                  |
|------------|----------------------------------|
| Define By  | Vector                           |
| Magnitude  | 9810. mm/s <sup>2</sup> (ramped) |
| Direction  | Defined                          |
| Suppressed | No                               |

**FIGURE 2**

**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Acceleration**



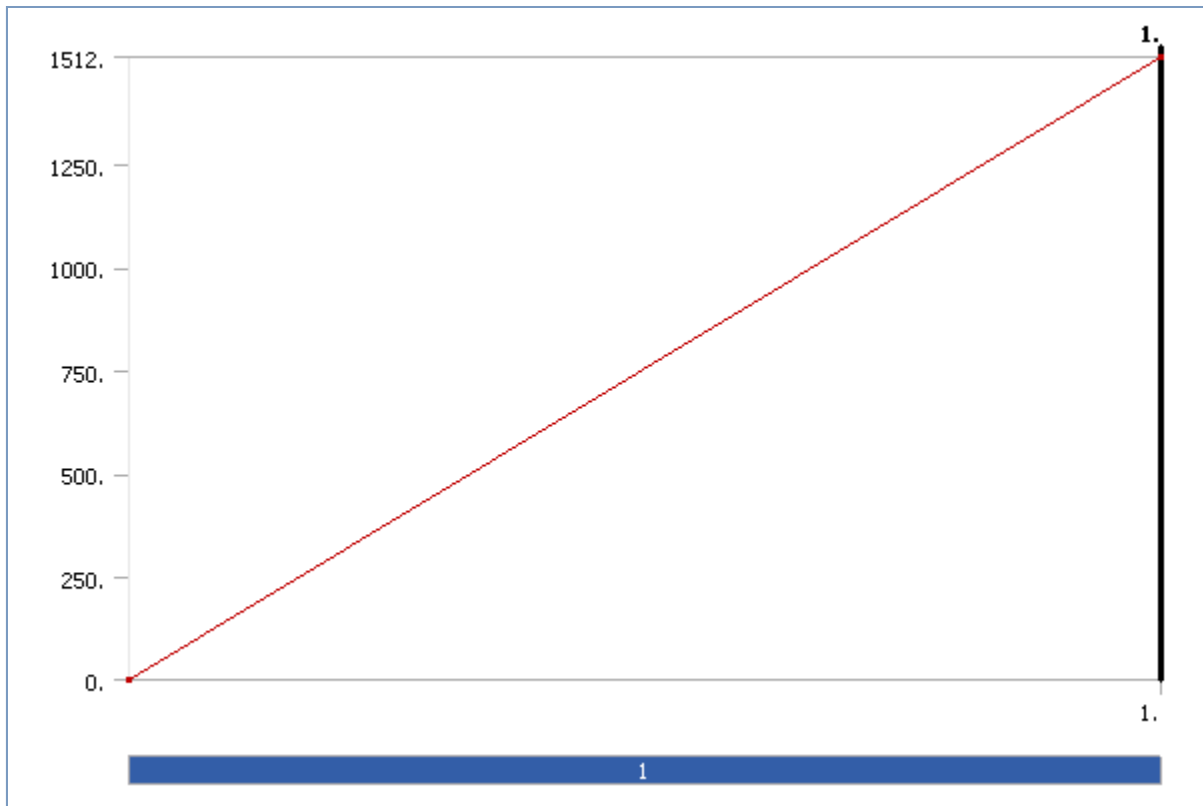
**TABLE 27**

**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Loads**

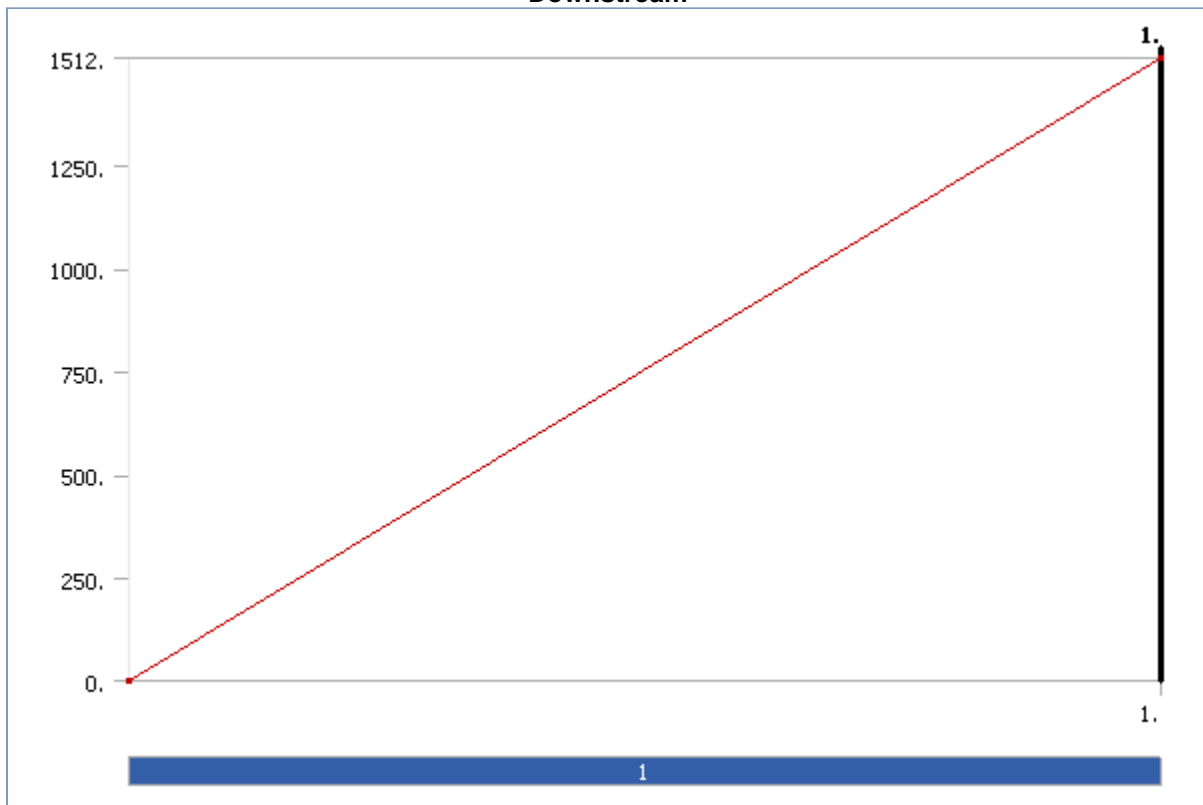
| Object Name       | <i>Right Upstream</i> | <i>Right Downstream</i> | <i>Left Upstream</i> | <i>Left Downstream</i> | <i>Left Hinge</i> |
|-------------------|-----------------------|-------------------------|----------------------|------------------------|-------------------|
| State             |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

**FIGURE 3**

**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Right Upstream**



**FIGURE 4**  
Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Right Downstream



**FIGURE 5**

Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Left Upstream

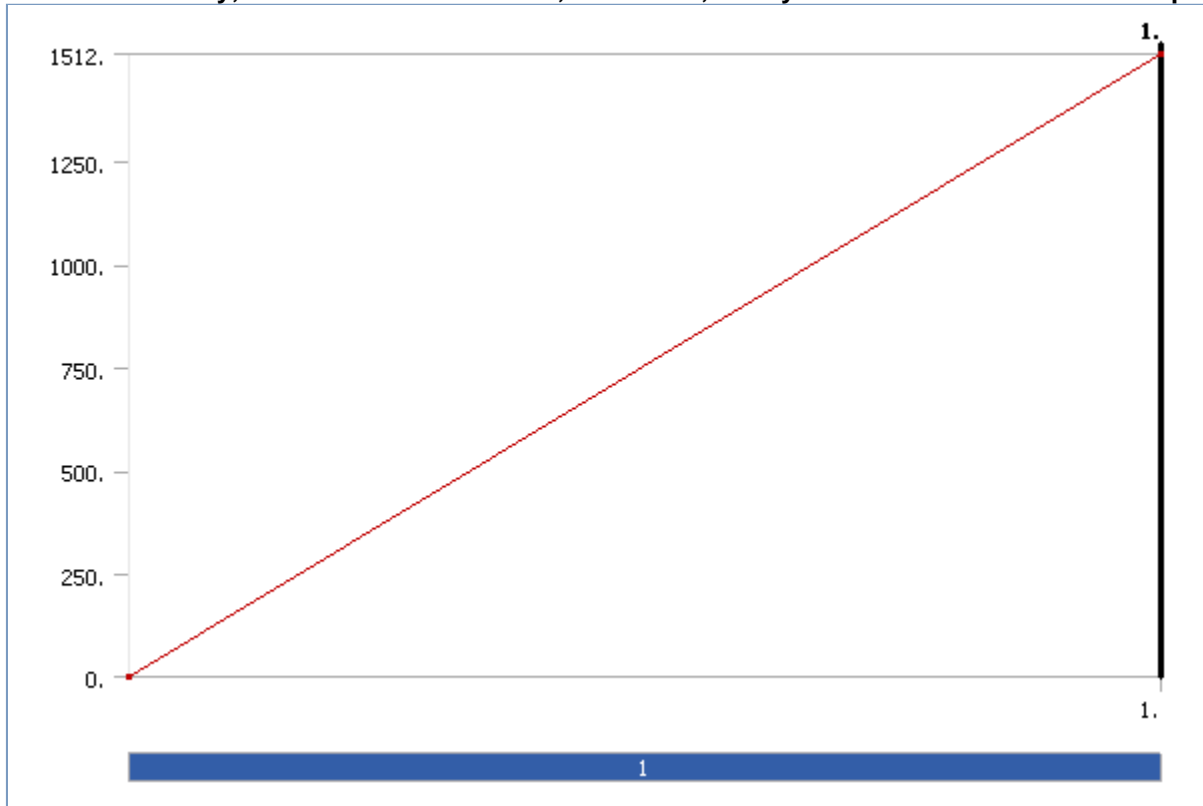
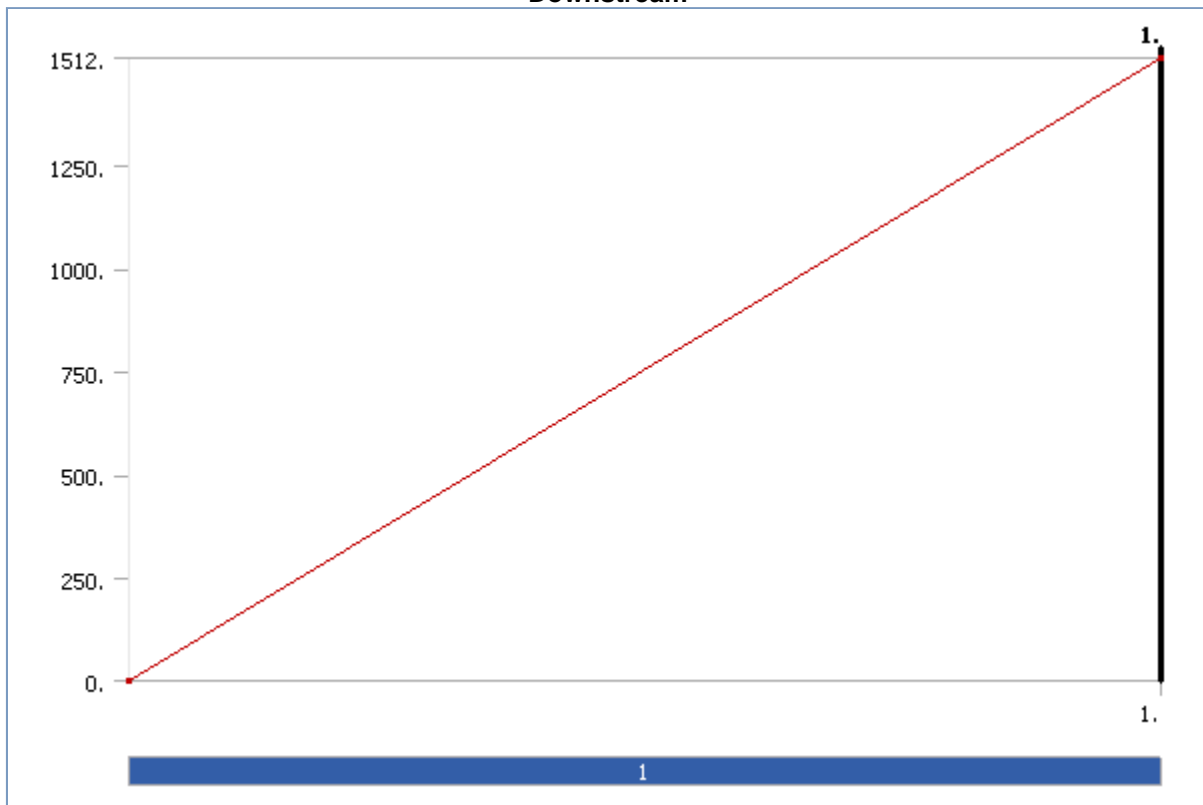
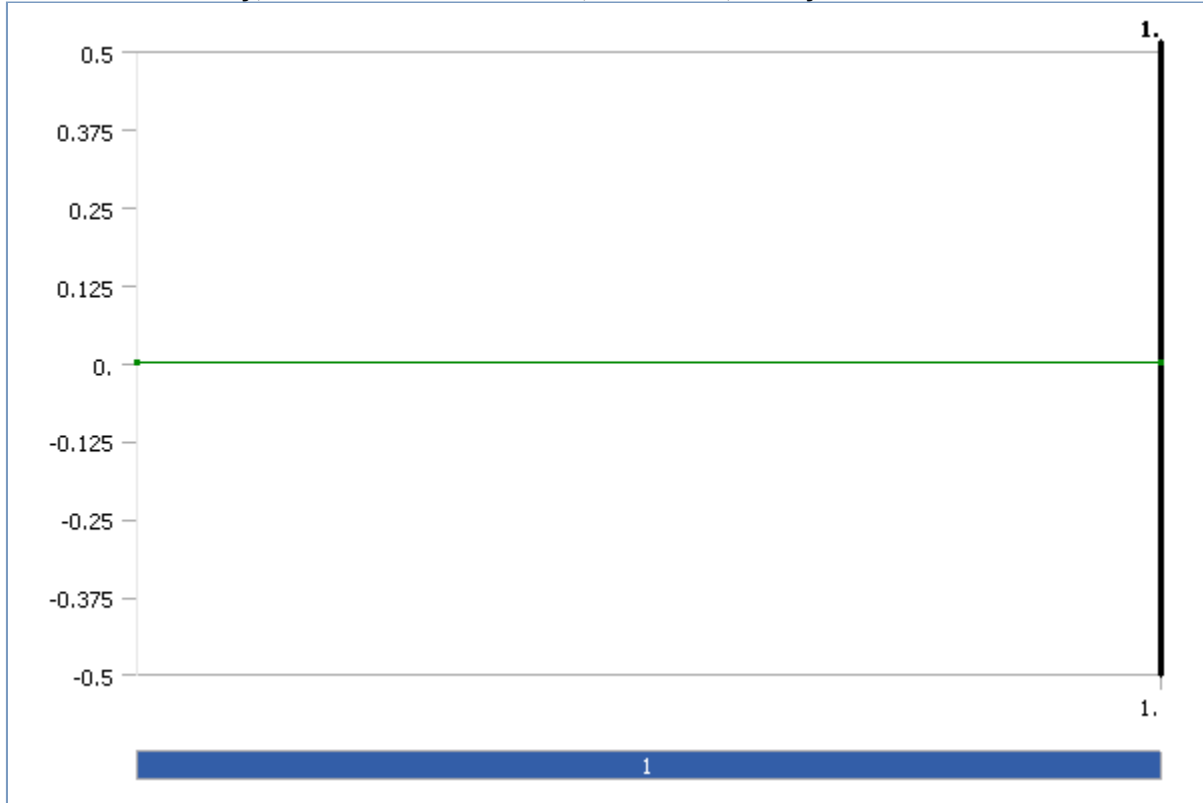


FIGURE 6

Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Left Downstream



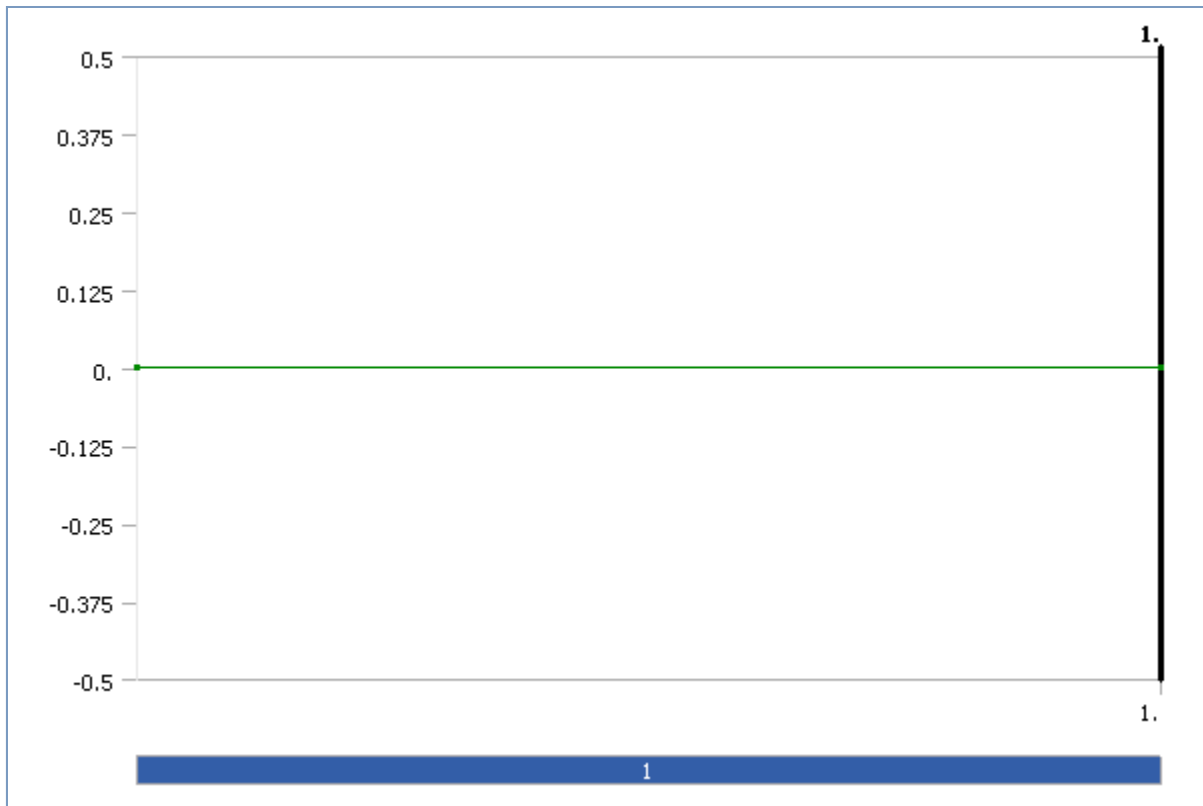
**FIGURE 7**  
**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Left Hinge**



**TABLE 28**  
**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Loads**

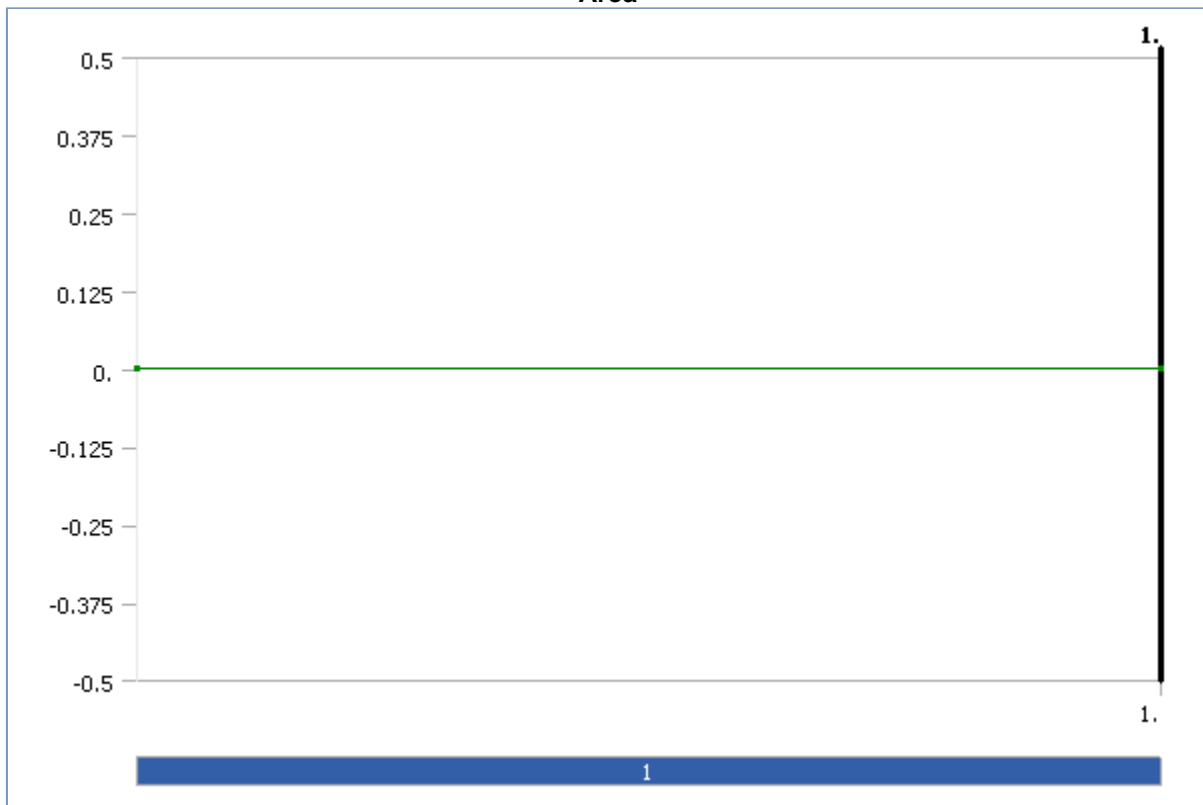
|                   |                    |                       |
|-------------------|--------------------|-----------------------|
| Object Name       | <i>Right Hinge</i> | <i>Nose Face Area</i> |
| State             | Fully Defined      |                       |
| <b>Scope</b>      |                    |                       |
| Scoping Method    | Geometry Selection |                       |
| Geometry          | 5 Faces            | 1 Face                |
| <b>Definition</b> |                    |                       |
| 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, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Right Hinge**



**FIGURE 9**

**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Nose Face Area**



***Solution***

**TABLE 29**  
**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Solution**

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

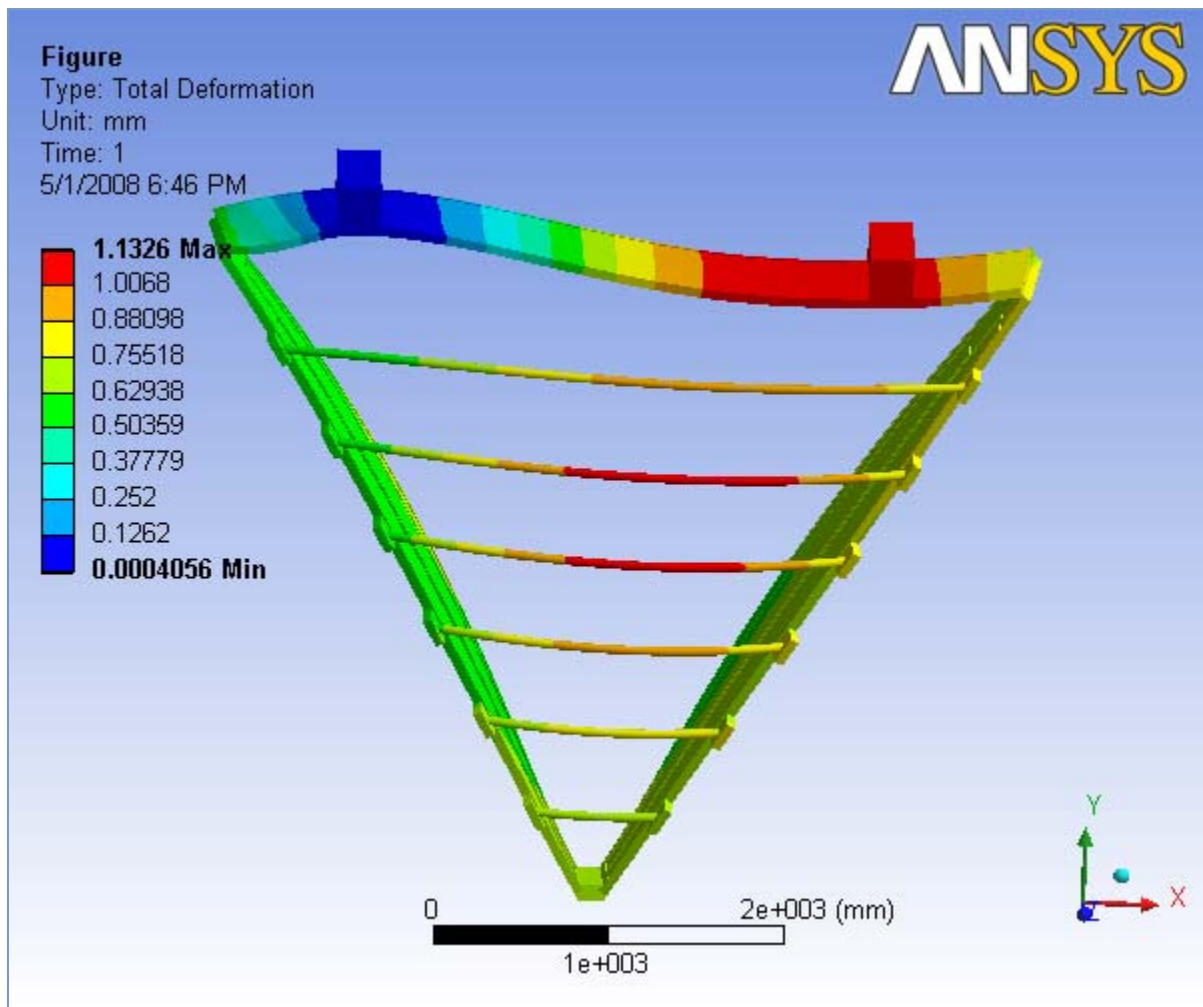
**TABLE 30**  
**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Solution > Solution Information**

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

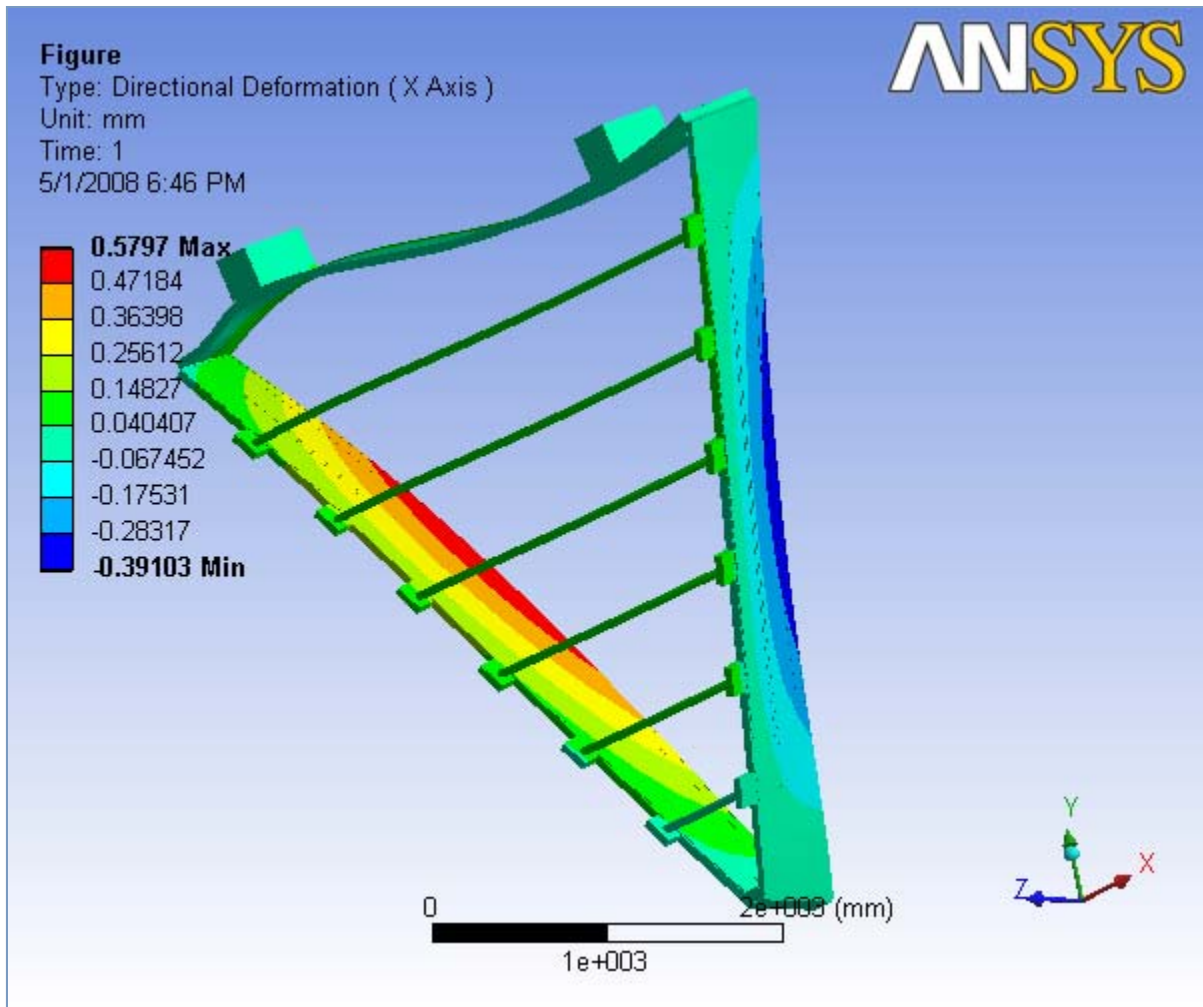
**TABLE 31**  
**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Solution > Results**

| Object Name        | <i>Total Deformation</i>     | <i>X Deformation</i>             | <i>Y Deformation</i>         | <i>Z Deformation</i>          | <i>Equivalent Stress</i>      |
|--------------------|------------------------------|----------------------------------|------------------------------|-------------------------------|-------------------------------|
| State              | Solved                       |                                  |                              |                               |                               |
| <b>Scope</b>       |                              |                                  |                              |                               |                               |
| Geometry           | All Bodies                   |                                  |                              |                               |                               |
| <b>Definition</b>  |                              |                                  |                              |                               |                               |
| Type               | Total Deformation            | Directional Deformation          |                              |                               | Equivalent (von-Mises) Stress |
| Display Time       | End Time                     |                                  |                              |                               |                               |
| Orientation        |                              | X Axis                           | Y Axis                       | Z Axis                        |                               |
| Shell              |                              |                                  |                              |                               | Top/Bottom                    |
| <b>Results</b>     |                              |                                  |                              |                               |                               |
| Minimum            | 4.056e-004 mm                | -0.39103 mm                      | -1.1319 mm                   | -0.24273 mm                   | 1.0428e-005 MPa               |
| Maximum            | 1.1326 mm                    | 0.5797 mm                        | 3.0055e-002 mm               | 0.59635 mm                    | 22.176 MPa                    |
| Minimum Occurs On  | Left Hinge                   | Right Endplate Inner Steel Slice | Back Plate Inner Steel slice | Left Endplate Aluminum Casing | 60 Deg Ref line               |
| Maximum Occurs On  | Back Plate Inner Steel slice | Left Endplate Inner Steel slice  | Left Hinge                   | Rod 5                         | Backplate Outer steel slice   |
| <b>Information</b> |                              |                                  |                              |                               |                               |
| Time               | 1. s                         |                                  |                              |                               |                               |
| Load Step          | 1                            |                                  |                              |                               |                               |
| Substep            | 1                            |                                  |                              |                               |                               |
| Iteration Number   | 1                            |                                  |                              |                               |                               |

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

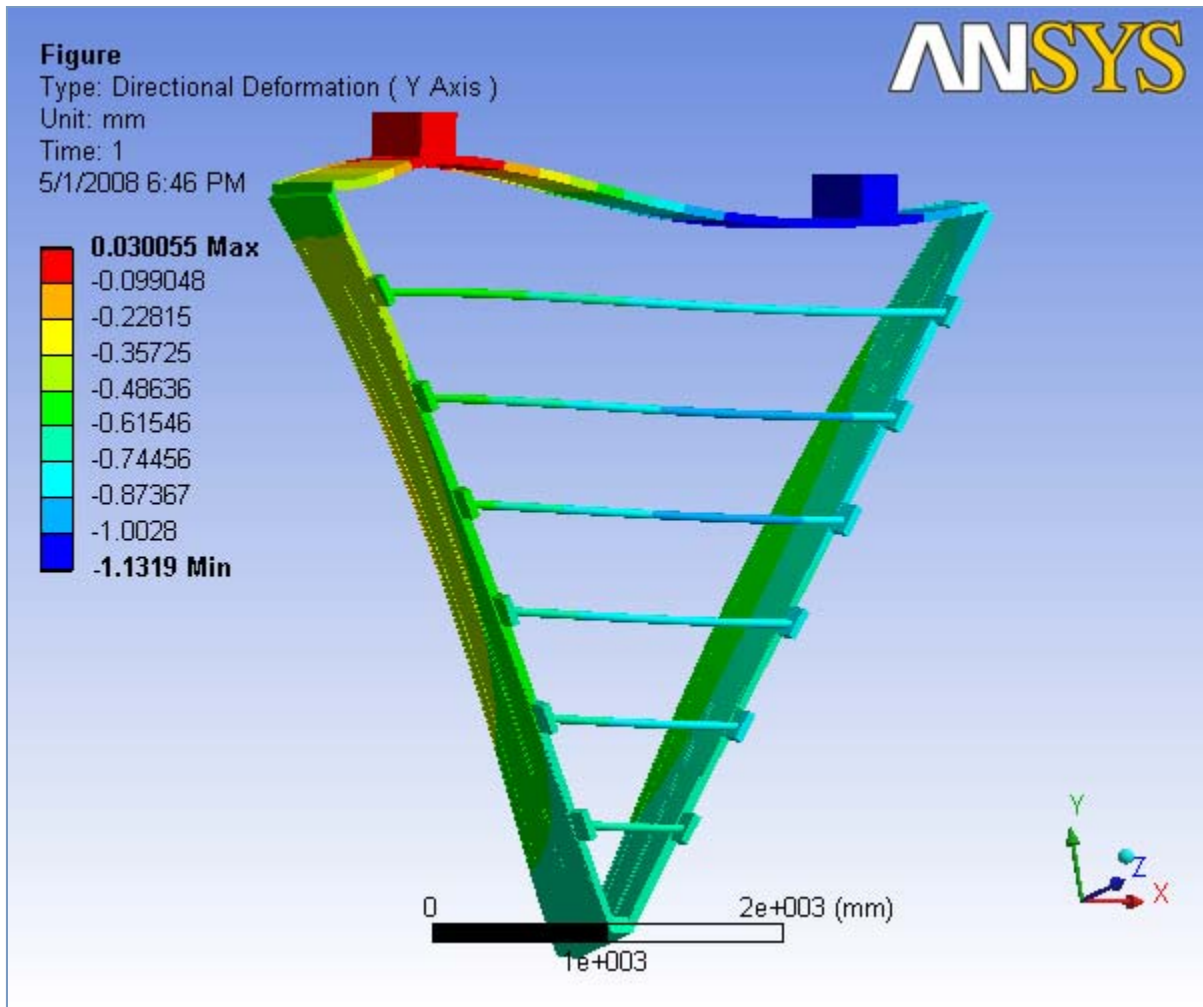


**FIGURE 11**  
Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Solution > X  
Deformation > Figure

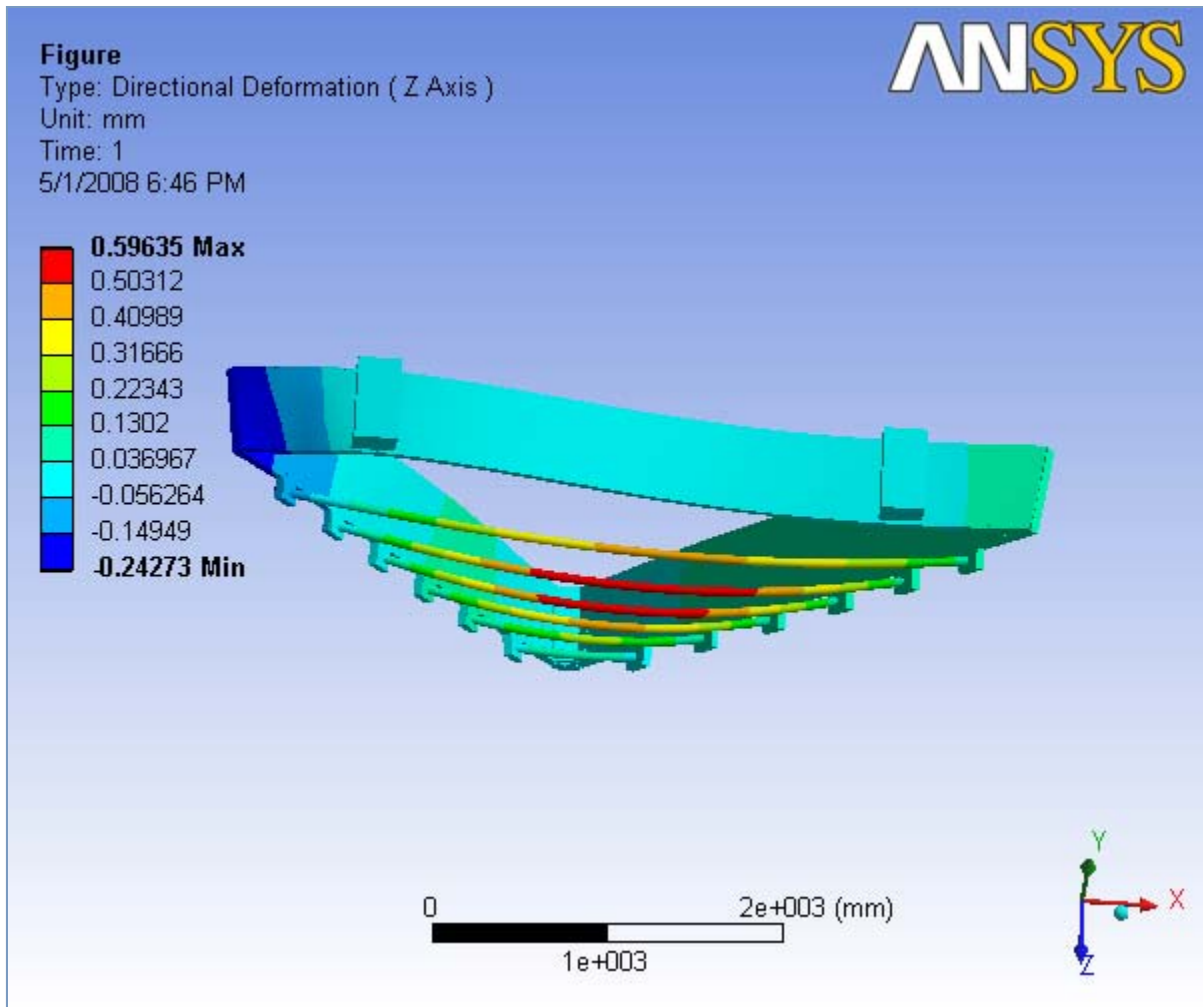


**FIGURE 12**  
 Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Solution > Y  
 Deformation > Figure

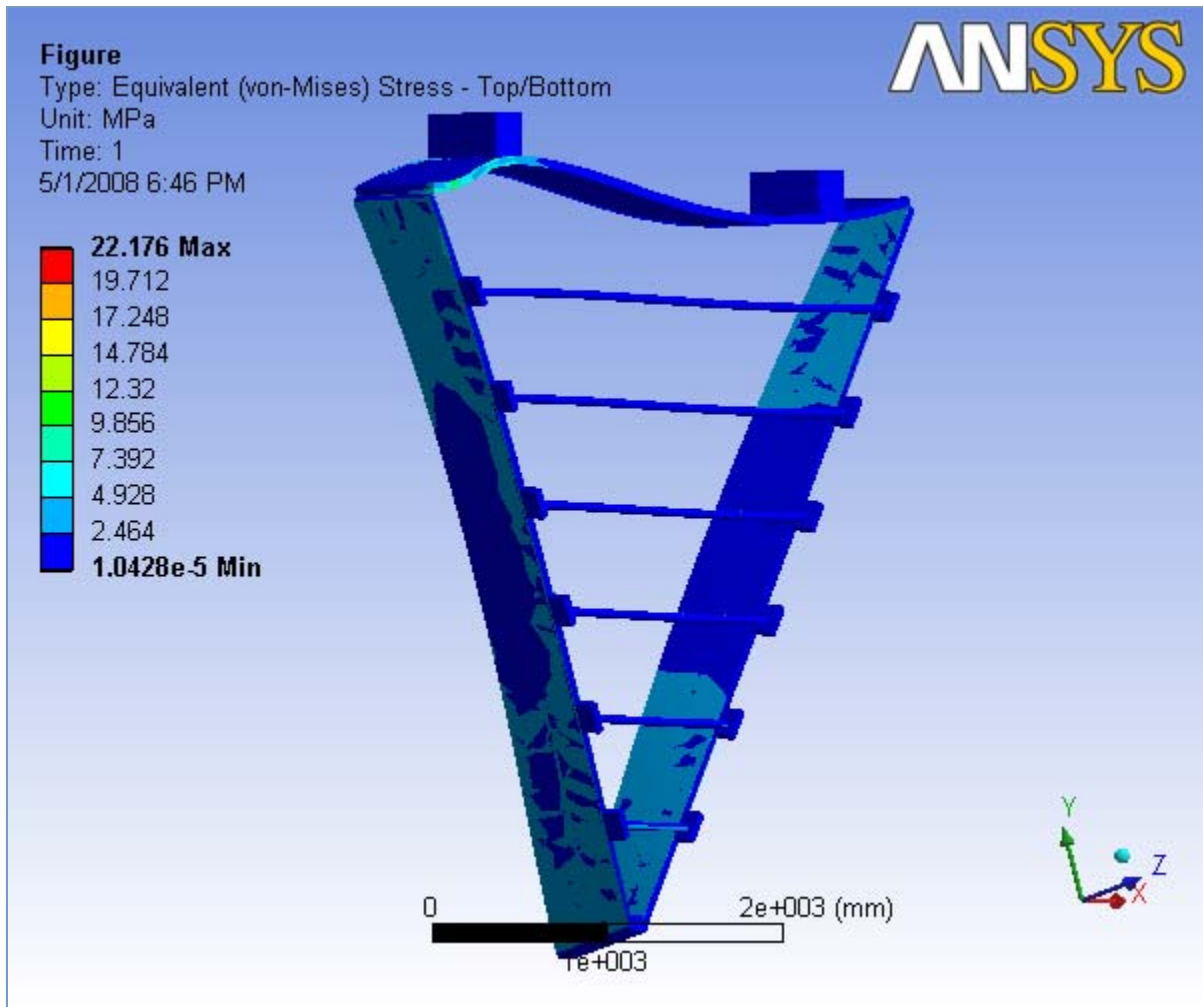




**FIGURE 13**  
 Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Solution > Z Deformation > Figure



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

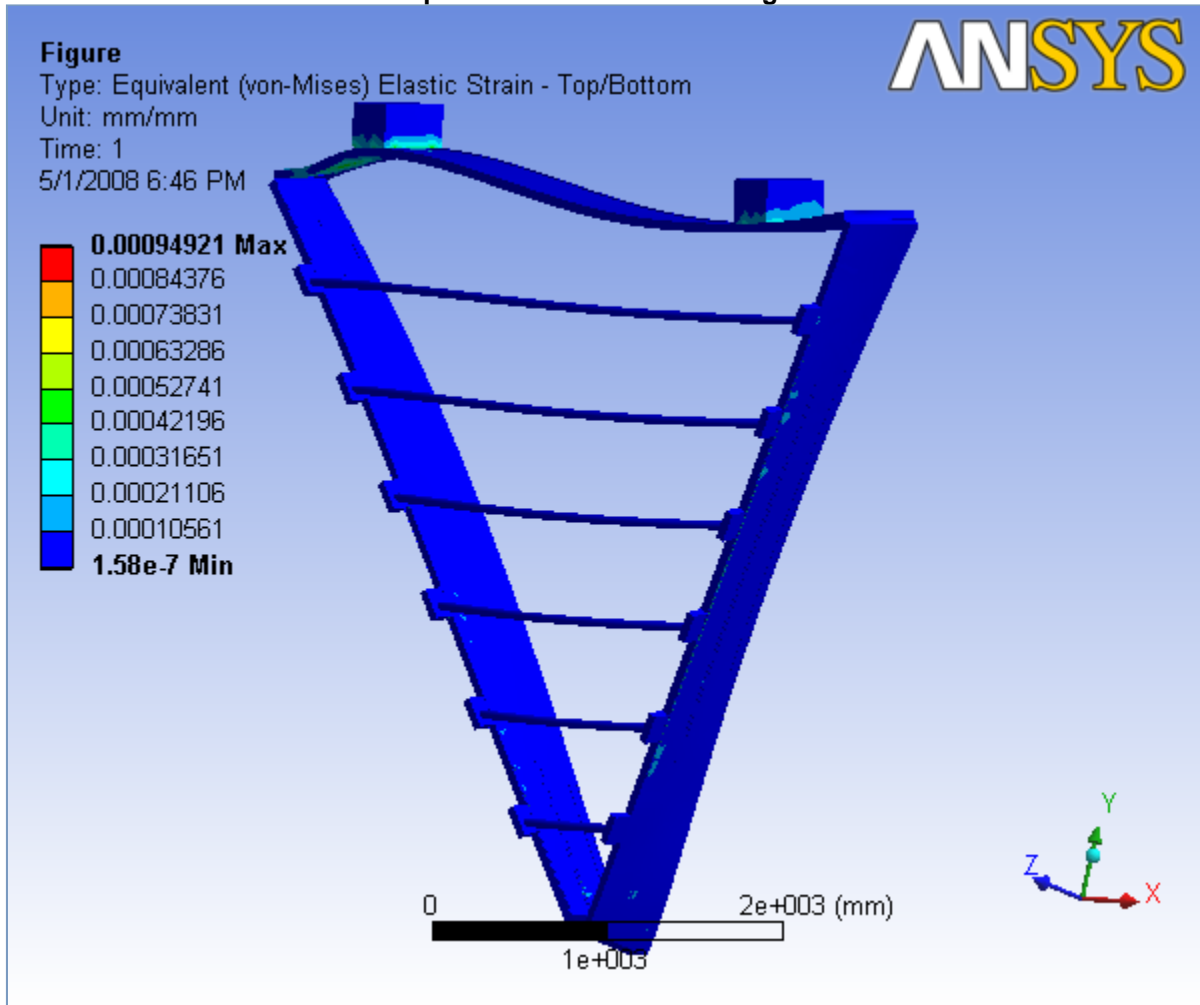


**TABLE 32**

**Ideal Slice with Gravity, Wire Tensions and Rods, No Hexcel, No Mylar > Static Structural > Solution > Results**

|                    |                                       |
|--------------------|---------------------------------------|
| Object Name        | <i>Equivalent Elastic Strain</i>      |
| State              | Solved                                |
| <b>Scope</b>       |                                       |
| Geometry           | All Bodies                            |
| <b>Definition</b>  |                                       |
| Type               | Equivalent (von-Mises) Elastic Strain |
| Shell              | Top/Bottom                            |
| Display Time       | End Time                              |
| <b>Results</b>     |                                       |
| Minimum            | 1.58e-007 mm/mm                       |
| Maximum            | 9.4921e-004 mm/mm                     |
| Minimum Occurs On  | 60 Deg Ref line                       |
| Maximum Occurs On  | Left Hinge                            |
| <b>Information</b> |                                       |
| Time               | 1. s                                  |
| Load Step          | 1                                     |
| Substep            | 1                                     |
| Iteration Number   | 1                                     |

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



## Material Data

### Aluminum

**TABLE 33**  
**Aluminum > Constants**

| <b>Structural</b>       |                             |
|-------------------------|-----------------------------|
| Young's Modulus         | 68900 MPa                   |
| Poisson's Ratio         | 0.33                        |
| Density                 | 2.7e-006 kg/mm <sup>3</sup> |
| Thermal Expansion       | 2.3e-005 1/°C               |
| <b>Thermal</b>          |                             |
| Thermal Conductivity    | 0. W/mm·°C                  |
| Specific Heat           | 0. J/kg·°C                  |
| <b>Electromagnetics</b> |                             |
| Relative Permeability   | 0.                          |
| Resistivity             | 0. Ohm-mm                   |

## Polyurethane

**TABLE 34**  
**Polyurethane > Constants**

| <b>Structural</b>       |                             |
|-------------------------|-----------------------------|
| Young's Modulus         | 66. MPa                     |
| Poisson's Ratio         | 0.3                         |
| Density                 | 2.4e-007 kg/mm <sup>3</sup> |
| Thermal Expansion       | 6.12e-005 1/°C              |
| <b>Thermal</b>          |                             |
| Thermal Conductivity    | 0. W/mm·°C                  |
| Specific Heat           | 0. J/kg·°C                  |
| <b>Electromagnetics</b> |                             |
| Relative Permeability   | 0.                          |
| Resistivity             | 0. Ohm-mm                   |

## Stainless Steel

**TABLE 35**  
**Stainless Steel > Constants**

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

## Carbon fiber

**TABLE 36**  
**Carbon fiber > Constants**

| <b>Structural</b>       |                             |
|-------------------------|-----------------------------|
| Young's Modulus         | 1.5e+005 MPa                |
| Poisson's Ratio         | 0.3                         |
| Density                 | 5.8e-007 kg/mm <sup>3</sup> |
| Thermal Expansion       | 0. 1/°C                     |
| <b>Thermal</b>          |                             |
| Thermal Conductivity    | 0. W/mm·°C                  |
| Specific Heat           | 0. J/kg·°C                  |
| <b>Electromagnetics</b> |                             |
| Relative Permeability   | 0.                          |
| Resistivity             | 0. Ohm-mm                   |