The Nelco N8000 is a high-Tg cyanate ester laminate and prepreg system that provides superior performance and product integrity and is ideal for board designs with higher layer counts, finer lines and spaces and larger panel sizes.

**Key Features**

**High thermal performance**
- Tg of 250°C by DSC
- Low Z-axis expansion
- Suitable for high-layer count, sophisticated PWB designs
- Superior properties for high speed, high reliability and controlled impedance board applications

**Superior electrical properties**
- Supports signal speed capabilities not achievable through a standard epoxy or polyimide
- Low Dk and Df to meet high speed, low loss design requirements

**Typical Cyanate Ester processing**
- 240 min press at 182°C and 200-300 psi.

**S-glass and Quartz options**
- Available with S-glass which provides a lower X/Y CTE over standard E-glass
- Available with quartz fabric reinforcement for extremely harsh environment and critical low loss designs

**And Much More**
- Vacuum laminated
- Available in a wide variety of constructions, copper weights and glass styles including standard copper, double treat and RTFOIL® laminate
- Meets UL 94V-0 and IPC-4101/70 (s-glass) and /71 (e-glass) specifications
- All Nelco materials are RoHS compliant

**Applications**

- Fine-Line Multilayers
- Backplanes
- Surface-Mount Multilayers
- BGA Multilayers
- MCM-L’s
- Direct Chip Attach
- Automotive
- Underhood Automotive
- Wireless Communications
- High Speed Computing
- Radomes and Secondary Aerospace Structures

**Global Availability**

Contact us worldwide:
Nelco, California +1.714.879.4293
Nelco, New York +1.845.567.6200
Neltec, Arizona +1.480.967.5600
Nelco, Asia Pacific +65.6861.7117
Neltec Europe SAS +33.380.10.10.00
Neltec, SA +33.562.98.52.90
www.parkelectro.com info@parkelectro.com

Park’s UL file number: E36295
## Mechanical Properties

<table>
<thead>
<tr>
<th></th>
<th>N8000</th>
<th>N8000Q</th>
<th>U.S. Units</th>
<th>N8000</th>
<th>N8000Q</th>
<th>Metric</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peel Strength - 1 oz. (35 micron) Cu</td>
<td>8.0</td>
<td>10</td>
<td>lb/inch</td>
<td>1.40</td>
<td>1.75</td>
<td>N/mm</td>
<td>IPC-TM-650.2.4.8</td>
</tr>
<tr>
<td>At Solder Float</td>
<td>7.5</td>
<td>-</td>
<td>lb/inch</td>
<td>1.31</td>
<td>-</td>
<td>N/mm</td>
<td>IPC-TM-650.2.4.8.2a</td>
</tr>
<tr>
<td>After Exposure to Process Solutions</td>
<td>8.0</td>
<td>10</td>
<td>lb/inch</td>
<td>1.40</td>
<td>1.75</td>
<td>N/mm</td>
<td>IPC-TM-650.2.4.8</td>
</tr>
<tr>
<td>X/Y CTE [-40°C to +125°C]</td>
<td>11 - 13</td>
<td>-</td>
<td>ppm/°C</td>
<td>11 - 13</td>
<td>-</td>
<td>ppm/°C</td>
<td>IPC-TM-650.2.4.8</td>
</tr>
<tr>
<td>Z Axis CTE Alpha 1 [50°C to Tg]</td>
<td>-</td>
<td>70</td>
<td>ppm/°C</td>
<td>-</td>
<td>70</td>
<td>ppm/°C</td>
<td>IPC-TM-650.2.4.8</td>
</tr>
<tr>
<td>Z Axis CTE Alpha 2 [Tg to 260°C]</td>
<td>-</td>
<td>375</td>
<td>ppm/°C</td>
<td>-</td>
<td>375</td>
<td>ppm/°C</td>
<td>IPC-TM-650.2.4.8</td>
</tr>
<tr>
<td>Z Axis Expansion [50°C to 260°C]</td>
<td>2.5</td>
<td>2.5</td>
<td>%</td>
<td>2.5</td>
<td>2.5</td>
<td>%</td>
<td>IPC-TM-650.2.4.41</td>
</tr>
<tr>
<td>Young's Modulus (X/Y)</td>
<td>3.0/3.0</td>
<td>2.6/2.3</td>
<td>psi x 10^6</td>
<td>20.4/20.4</td>
<td>17.6/15.6</td>
<td>G/ m²</td>
<td>ASTM D3039</td>
</tr>
<tr>
<td>Poisson's Ratios (X/Y)</td>
<td>0.14/0.14</td>
<td>0.16/0.16</td>
<td></td>
<td>0.14/0.14</td>
<td>0.16/0.16</td>
<td></td>
<td>ASTM D3039</td>
</tr>
<tr>
<td>Thermal Conductivity (Z/X-Y)</td>
<td>-0.34/0.54</td>
<td>-</td>
<td>W/mK</td>
<td>-0.34/0.54</td>
<td>-</td>
<td>W/mK</td>
<td>ASTM E1461</td>
</tr>
<tr>
<td>Specific Heat</td>
<td>-</td>
<td>1.0</td>
<td>J/gK</td>
<td>-</td>
<td>1.0</td>
<td>J/gK</td>
<td>ASTM E1461</td>
</tr>
</tbody>
</table>

## Electrical Properties

### Dielectric Constant (50% resin content)
- @ 1 GHz (RF Impedance): 3.7, 3.3
- @ 2.5 GHz (Stripline): 3.6
- @ 10 GHz (Stripline): 3.5, 3.2

### Dissipation Factor (50% resin content)
- @ 2.5 GHz (Stripline): 0.011
- @ 10 GHz (Stripline): 0.011, 0.006

### Volume Resistivity
- C - 96/35/90: 10^7 MΩ - cm
- E - 24/125: 10^7 MΩ - cm

### Surface Resistivity
- C - 96/35/90: 10^7 MΩ
- E - 24/125: 10^7 MΩ

### Electric Strength
- >50 kV/mil

### Dielectric Breakdown
- >50 kV

### Arc Resistance
- 160 seconds

## Thermal Properties

### Glass Transition Temperature (Tg)
- DSC (°C): 250, 250 °C
- TMA (°C): 240, 240 °C
- DMA (°C) (Tan δ Peak): 300, 300 °C
- Degradation Temp (TGA) (5% wt. loss): 376 - °C
- Pressure Cooker-60 min then solder dip @288°C until failure: 60+ minutes

### Chemical/Physical Properties

<table>
<thead>
<tr>
<th></th>
<th>&lt;0.05</th>
<th>% wt. chg.</th>
<th>1.73</th>
<th>g/cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture Absorption</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methylene Chloride Resistance</td>
<td>0.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Density [50% resin content]</td>
<td>1.73</td>
<td></td>
<td></td>
<td>1.73</td>
</tr>
</tbody>
</table>

Park Electrochemical Corp. is a global advanced materials company which develops and manufactures high-technology digital and RF/microwave printed circuit materials and advanced composite materials. The company operates under the Nelco® and Nelcote™ names.

All test data provided are typical values and not intended to be specification values. For review of critical specification tolerances, please contact a Nelco representative directly. Nelco reserves the right to change these typical values as a natural process of refining our testing equipment and techniques.

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*CAF resistance has been established to greater than 500 hours using a specific OEM coupon design and test procedure. For details on this or other CAF tests, please visit www.parkelectro.com.

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