High Performance Precious Metal Alloys for Semiconductor Wafer Test Systems

Application-Specific Precious Metal Alloys Developed for...

- Buckling Beam Probes
- Cantilever Probes
- LED Probes
- Straight Needles
- Cobra Probes
- Pogo Pin Tips
- Vertical Probes
- Potentiometers
- Electrochemical Deposition
- Low Noise Contact Systems

PALINEY® Palladium Alloys
NEYORO™ Gold Alloys

Deringer-Ney’s semiconductor alloys and manufacturing techniques are continually evolving to meet the increased demands for smaller component sizes. Pictured above is a cobra probe and two tip configurations commonly used in semiconductor wafer test probe cards.
### ROD
**Straight Lengths**
1.5 mm to 7mm dia  
(0.060 in to 0.275 in)

### WIRE
**Spoiled**
20 um to 1.45 mm dia  
(0.0008 in to 0.57 in)

### STRIP & RIBBON
**Spoiled**
50 um to 380 um thick  
(0.002 in to 0.015 in)  
2 mm to 89mm wide  
(0.080 in to 3.50 in)

Note: Please consult factory for specific material availability and temper, or custom requirements.

<table>
<thead>
<tr>
<th>Alloy Property</th>
<th>Paliney® 7</th>
<th>Paliney® H3C</th>
<th>Paliney® C</th>
<th>Paliney® 25</th>
<th>Neyoro™ G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solidus °C</td>
<td>1,080</td>
<td>956</td>
<td>925</td>
<td>1,090</td>
<td>925</td>
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<tr>
<td>Density g/cm³</td>
<td>11.8</td>
<td>10.4</td>
<td>10.4</td>
<td>10.5</td>
<td>15.9</td>
</tr>
<tr>
<td>Electrical Resistivity μΩ-cm @ 20°C</td>
<td>31.6</td>
<td>12.3</td>
<td>10.1</td>
<td>6.35</td>
<td>14.5</td>
</tr>
<tr>
<td>CTE 1/K</td>
<td>13.5 x 10⁻⁶</td>
<td>13.9 x 10⁻⁶</td>
<td>14.4 x 10⁻⁶</td>
<td>12.7 x 10⁻⁶</td>
<td>12.6 x 10⁻⁶</td>
</tr>
<tr>
<td>Knoop Hardness heat treated HK</td>
<td>350</td>
<td>450</td>
<td>350</td>
<td>400</td>
<td>325</td>
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<tr>
<td>Yield Strength MPa</td>
<td>1,103</td>
<td>1,620</td>
<td>1,135</td>
<td>1,035</td>
<td>896</td>
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<tr>
<td>Total Elongation %</td>
<td>5</td>
<td>2.5</td>
<td>2</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Elastic Modulus GPa</td>
<td>123</td>
<td>122</td>
<td>117</td>
<td>135</td>
<td>110</td>
</tr>
</tbody>
</table>

### Alloy Configuration
- **Age Hardenable Pd-Ag-Cu Alloy**
- **Age Hardenable Au Alloy**

### Advantages
- **tarnish resistant**
- **good nobility**
- **very high hardness and conductivity**
- **tarnish resistant, but less noble than Paliney 7**
- **similar tarnish resistance and conductivity as H3C**
- **better cold forming ability than H3C**
- **better tarnish resistance than H3C**
- **excellent formability**
- **best conductivity of all the Pd based alloys**
- **excellent tarnish resistance**
- **low adhesion to debris**

### Typical Applications
- **test probes - cantilever, cobra, vertical probe pins**
- **electrodes for corrosive environments**
- **potentiometers**
- **slip rings**
- **low noise contacts**

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