AW-99 (99.99% pure) provides the highest strength and modulus 4N wire in the market today. This gold bonding wire is a broad performing alloy with mechanical properties comparable to leading 2N alloys while retaining the electrical properties of 4N wires. AW-99’s large bonding window, excellent resistance to sway and mold sweep coupled with robust looping characteristics makes it a preferred choice for multiple applications including those for the finest pad pitch (down to 35 µm) and the most rigorous looping. In addition, AW-99 is beryllium free and is compatible even to sensitive/thin pad structures.

**Recommended Technical Data of AW-99**

<table>
<thead>
<tr>
<th>Diameter (µm)</th>
<th>Microns</th>
<th>15</th>
<th>18</th>
<th>20</th>
<th>23</th>
<th>25</th>
<th>28</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mil</td>
<td>0.6</td>
<td>0.7</td>
<td>0.8</td>
<td>0.9</td>
<td>1.0</td>
<td>1.1</td>
<td>1.2</td>
</tr>
</tbody>
</table>

**Recommended Specs for Ball Bonding**

<table>
<thead>
<tr>
<th>Elongation (%)</th>
<th>2 – 5</th>
<th>2 – 6</th>
<th>2 – 6</th>
<th>2 – 7</th>
<th>2 – 7</th>
<th>2 – 7</th>
<th>2 – 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breaking Load (g)</td>
<td>3 – 6</td>
<td>4 – 8</td>
<td>5 – 10</td>
<td>7 – 12</td>
<td>9 – 14</td>
<td>11 – 16</td>
<td>13 – 20</td>
</tr>
</tbody>
</table>

**In-Line Pad Pitch (µm)**

| Min. In-Line Pad Pitch | 35 | 45 | 50 | 60 | 65 | 70 | 80 |

For other diameters, please contact Heraeus Bonding Wires sales representative.

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**Application Data**

First bond results on optimum setting:

<table>
<thead>
<tr>
<th>Ball Diameter (µm)</th>
<th>Squash Height (µm)</th>
<th>Shear Force (g)</th>
<th>Shear Strength (g/mil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>31.8</td>
<td>10.2</td>
<td>12.4</td>
</tr>
<tr>
<td>Std Dev</td>
<td>0.4</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Min</td>
<td>37.5</td>
<td>9.0</td>
<td>11.7</td>
</tr>
<tr>
<td>Max</td>
<td>38.8</td>
<td>11.2</td>
<td>13.3</td>
</tr>
</tbody>
</table>

*Results may vary with package and die configuration, as well as bond process.

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**AW-99 Benefits**

- Large process windows with robust 1st and 2nd bonds for a wide range of applications and pad pitch (down to 35 µm)
- Highest strength and modulus comparable to 2N (99%) Au alloy
- Robust looping and shortest HAZ length caters for demanding and ultra-low loops such as multi-stacked die and multi-tier BGA configurations
- High strength retention provides excellent resistance to sway and mold sweep
- Suitable for aggressive wire diameter reduction programs
- Delivers superior strength while retaining compatibility to sensitive/thin pad metallizations
- Environmental friendly – Beryllium free

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**AW-99**

Gold Bonding Wire for the Most Demanding Looping and Finest Pad Pitch
**AW-99 Characteristics for 25 µm diameter**

- **Non-Gold Elements**: < 100 ppm
- **Elastic Modulus**: ~ 90 GPa
- **Heat Affected Zone (HAZ)**: 40 – 170 µm
- **Melting Point**: 1063 °C
- **Density**: 19.32 g/cm³
- **Heat Conductivity**: 3.17 W/cm·K
- **Electrical Resistivity**: 2.36 µΩ·cm
- **Coeff. of Linear Expansion (20 – 100°C)**: 14.2 ppm/K
- **Fusing Current for 25 µm, dia 10 mm length (in air)**: 0.37 A

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**Parameter Window for 1st Bond**

- **Relative Power**
  - 1.0
  - 1.1
  - 1.2
- **Relative Force**
  - 1.0
  - 1.1

**Parameter Window for 2nd Bond**

- **Relative Power**
  - 1.0
  - 1.1
  - 1.2
- **Relative Force**
  - 1.0
  - 1.1

---

**Gold Wire Segmentation by Properties**

- **Superior Reliability**
  - Widest Bonding Window
  - Highest Looping Performance
- **Electrical Performance**
  - Widest Bonding Window
  - Highest Looping Performance
- **High Loop / Low Loop**
  - Widest Bonding Window
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