Palladium Coated Copper Wire for IC Applications

Benefits and Features
- Improved performance
- Robust 2nd bond
- Reliability
- Soft FAB characteristics
- Simplified handling
- Longer floor/shelf life
- Oxidation protection
- Workable with N₂ gas

Robust 2nd Bond

FAB Hardness Data

Recommended Technical Data of PdSoft

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Microns (µm)</th>
<th>15</th>
<th>18</th>
<th>20</th>
<th>23</th>
<th>25</th>
<th>28</th>
<th>30</th>
<th>33</th>
<th>38</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mil</td>
<td></td>
<td>0.6</td>
<td>0.7</td>
<td>0.8</td>
<td>0.9</td>
<td>1</td>
<td>1.1</td>
<td>1.2</td>
<td>1.3</td>
<td>1.5</td>
<td>2</td>
</tr>
<tr>
<td>Breaking Load (g)</td>
<td></td>
<td>2 – 7</td>
<td>3 – 8</td>
<td>4 – 10</td>
<td>6 – 12</td>
<td>8 – 14</td>
<td>11 – 18</td>
<td>14 – 21</td>
<td>18 – 25</td>
<td>24 – 35</td>
<td>48 – 60</td>
</tr>
</tbody>
</table>

For other diameters, please contact Heraeus Bonding Wires sales representative.
Characteristics for 0.8 mil diameter

**Physical Properties**
- **Density**: 8.99 g/cm³
- **Melting Point**: 1083 °C
- **Thermal Conductivity**: 401 W/m·K
- **Specific Heat Capacity @ 25°C**: 385 J/kg·K·°C
- **Coeff. of Thermal Expansion**: 16.5 µm/m·°C (20 – 100°C)
- **Specific Electrical Resistivity**: 1.7 µΩ·cm
- **FAB Hardness (50 mA EFO)**: 90 – 105 HV (0.01 N/5 s)
- **Wire Hardness**: 95 – 105 HV (0.01 N/5 s)
- **Elastic Modulus**: 95 – 105 GPa

**Chemical Composition**
- **Copper**: 99.99 % min
- **Pd**: 1.3 % – 2.9%

**Mechanical Properties**
- **Elongation**: 11 – 17 %
- **Break Load**: 4 – 10 g

**Other Guidelines**
- **Floor Life**: 60 days
- **Shelf Life Time**: 6 months
- **Shielding Gas**: N² / Forming Gas

* Based on Core Material

**Ball Pull Result HTS 175°C up to 1500 hrs**

![Ball Pull Result HTS 175°C up to 1500 hrs](image)

Bonder: K&S Maxum Ultra, Capillary: K&S CU-FT-1115-P37, Device QFP 208L / Internal Test Die Al-1 % Si-0.5 % Cu, Al10,000Å, Ball Diameter: ~ 40 µm, PdSoft 0.8 mil

**Good Reliability under Isothermal aging**

1500 hrs 175°C aging

Slow and stable intermetallic growth
Passed HTS 1500 hrs 175°C (unmolded device)

**Extreme Wire Corrosion Test**

Condition: Corrosive fume environment at RT
Duration: 3.36 hrs

PdSoft Copper Wire

No oxidation found on wire surface

Bare Copper Wire

Severe oxidation found on wire surface

**Consistent FAB roundness in N² environment**

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The descriptions and engineering data shown here have been compiled by Heraeus using commonly-accepted procedures, in conjunction with modern testing equipment, and have been compiled as according to the latest factual knowledge in our possession. The information was up-to-date on the date this document was printed (latest versions can always be supplied upon request). Although the data is considered accurate, we cannot guarantee accuracy, the results obtained from its use, or any patent infringement resulting from its use. Users shall conduct tests to determine materials suitability for particular applications.

N. Layt, M.12541300:9.11