

## Semiconductor Wafer Test Alloys

### High Performance Precious Metal Alloys for Semiconductor Wafer Test Systems

#### Application-Specific Precious Metal Alloys Developed for...

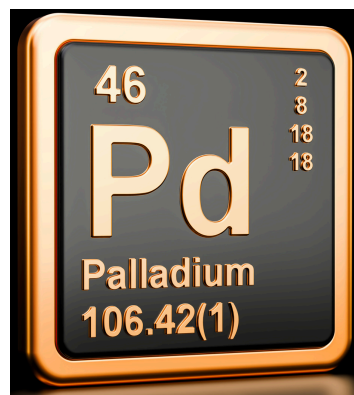
- Buckling Beam Probes
- Cantilever Probes
- Straight Needles
- Cobra Probes
- Pogo Pin Tips
- Vertical Probes
- Foil Probes for Laser Fabrication



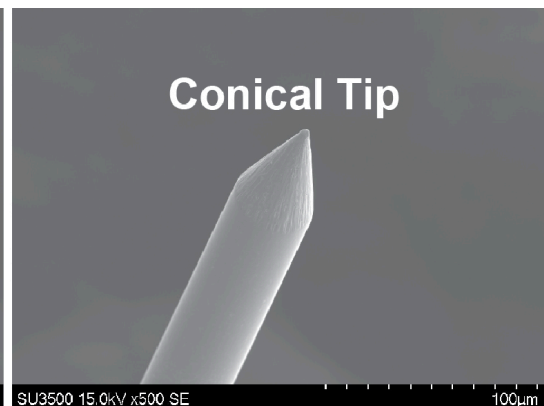
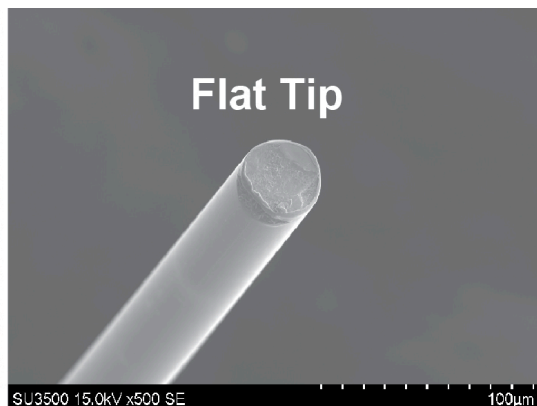
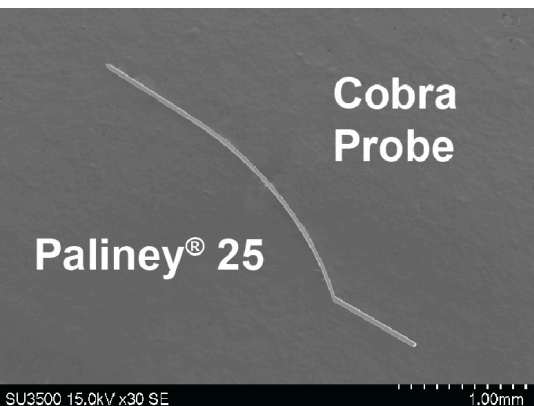
**Standard Foil  
Sizes Available:**

**10cm x 10cm and 5cm x 5cm**

**Thicknesses Range from: 16µm - 100µm**



**PALINEY®  
Palladium 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 7 mm dia  
(0.060 in to 0.275 in)

### WIRE

#### Spoiled

20  $\mu$ m to 1.45 mm dia  
(0.0008 in to 0.57 in)

### STRIP & RIBBON

#### Spoiled

50  $\mu$ m to 380  $\mu$ m thick  
(0.002 in to 0.015 in)  
2 mm to 89 mm wide  
(0.080 in to 3.50 in)

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

Alloy Property	Paliney <sup>®</sup> 7	Paliney <sup>®</sup> H3C	Paliney <sup>®</sup> C	Paliney <sup>®</sup> 23	Paliney <sup>®</sup> 25	Paliney <sup>®</sup> 35
Solidus (°C)	1,080	956	925	1,085	1,090	1,140
Density (g/cm <sup>3</sup> )	11.8	10.4	10.4	10.6	10.5	10.6
Electrical Resistivity, ( $\mu\Omega$ -cm @ 20°C)	31.6	12.3	10.1	7.2	6.4	5.2
CTE (1/K)	13.5 x 10	13.9 x 10	14.4 x 10	12.7 x 10	12.7 x 10	No data
Knoop Hardness (Heat treated HK)	350	450	350	460	400	340
Yield Strength (MPa)	1,103	1,620	1,135	1,190	1,035	1,030
Total Elongation (%)	5	2.5	2	4	10	25
Elastic Modulus (GPa)	135	122	117	135	135	137
Alloy Configuration	Age Hardenable Pd-Ag-Cu Alloy					
Conductivity	5.5% IACS	14% IACS	17% IACS	24% IACS	28% IACS	33% IACS
Advantages	<ul style="list-style-type: none"> <li>Tarnish resistant</li> <li>Good nobility</li> </ul>	<ul style="list-style-type: none"> <li>Very high hardness and conductivity</li> <li>Tarnish resistant, but less noble than Paliney 7</li> </ul>	<ul style="list-style-type: none"> <li>Similar tarnish resistance and conductivity as H3C</li> <li>Better cold forming ability than H3C</li> </ul>	<ul style="list-style-type: none"> <li>Excellent tarnish resistance</li> <li>Low adhesion to debris</li> <li>High hardness</li> </ul>	<ul style="list-style-type: none"> <li>Better tarnish and resistance than H3C</li> <li>Excellent formability</li> </ul>	<ul style="list-style-type: none"> <li>Best conductivity of all the Pd based alloys instead of Paliney 25</li> <li>Excellent Formability</li> </ul>
Typical Applications	<ul style="list-style-type: none"> <li>Test probes - cantilever, cobra, vertical probe pins</li> <li>Electrodes for corrosive environments</li> <li>Potentiometers</li> </ul>	<ul style="list-style-type: none"> <li>Test probes - cantilever, cobra; widely used for pogo pin tips</li> </ul>	<ul style="list-style-type: none"> <li>Test probes - cantilever, cobra, vertical probe pins</li> </ul>	<ul style="list-style-type: none"> <li>Test probes - cantilever, cobra, vertical probe pins, foil probes</li> </ul>		<ul style="list-style-type: none"> <li>Test probes - cantilever, cobra, vertical probe pins</li> </ul>

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