



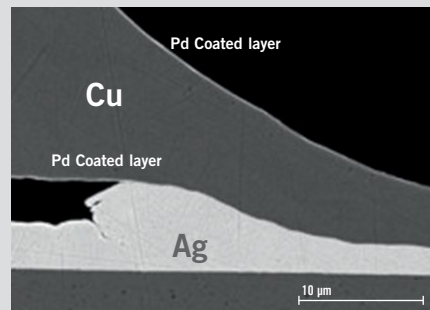
Palladium Coated Copper Wire for IC Applications



PdSoft Benefits and Features

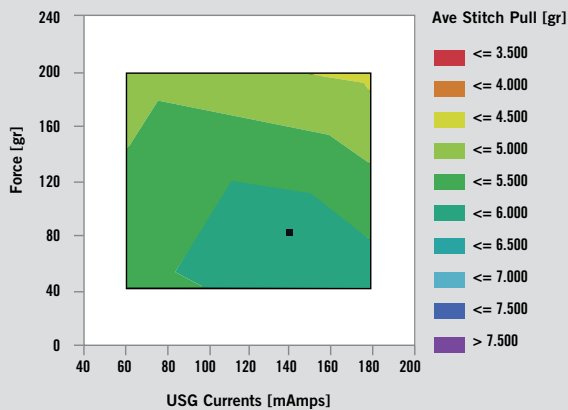
- Improved performance
 - Robust 2nd bond
 - Reliability
- Soft FAB characteristics
- Simplified handling
 - Longer floor/shelf life
 - Oxidation protection
 - Workable with N₂ gas

Robust 2nd Bond



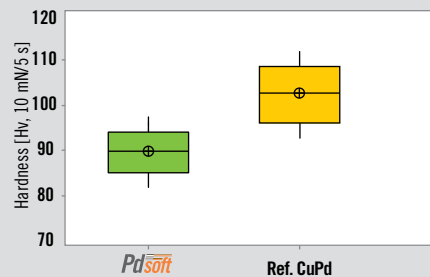
Pd Layer at the wire-substrate interface enhance ability to bond

2nd Bond Parameter Guideline for PdSoft



Fixed: Bonding time: 15 msec CV: 0.4
 Device: PBGA 2x2 Test Die, Wire Diameter: 0.8 mil PdSoft, Bonder: K&S Maxum Ultra,
 Bonding Temp.: 175°C Capillary: K&S CU-FF-1115-P37 (T2.7)

FAB Hardness Data



Wire Diameter: 18 µm, EFO current: 60 mA,
 FAB Diameter: 30 µm, Bonder: K&S iConn

Recommended Technical Data of PdSoft

Diameter	Microns (µm)	15	18	20	23	25	28	30	33	38	50
	Mils	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.5	2
Elongation	(%)	8 – 14	9 – 15	11 – 17	13 – 19	13 – 21	13 – 25	13 – 25	13 – 25	13 – 25	13 – 25
Breaking Load	(g)	2 – 7	3 – 8	4 – 10	6 – 12	8 – 14	11 – 18	14 – 21	18 – 25	24 – 35	48 – 60

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

PdSoft Characteristics for 0.8 mil diameter

Physical Properties

Density	8.99 g/cm ³
Melting Point *	1083 °C
Thermal Conductivity *	401 W/m.K
Specific Heat Capacity @ 25C *	385 J/kg.K
Coeff. of Thermal Expansion *	16.5 µm/m°C, (20 – 100°C)
Specific Electrical Resistivity	1.7 µΩ -cm
FAB Hardness (60 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

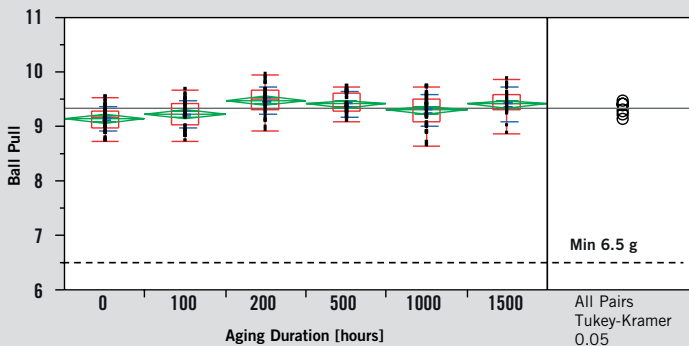
Elongation	11 – 17 %
Break Load	4 – 10 g

Other Guidelines

Floor Life	60 days
Shelf Life Time	6 months
Shielding Gas	N ₂ / Forming Gas

* Based on Core Material

Ball Pull Result HTS 175°C up to 1500 hrs



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

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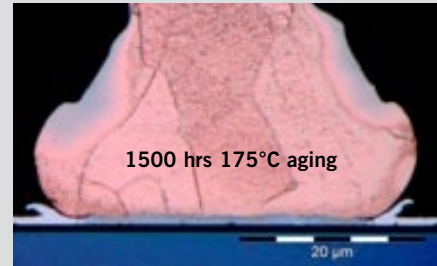
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Good Reliability under Isothermal aging

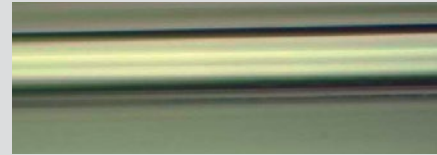


Slow and stable Intermetallic growth
Passed HTS 1500 hrs 175°C (unmolded device)

Extreme Wire Corrosion Test

Condition: Corrosive fume environment at RT
Duration: 336 hrs

PdSoft Copper Wire



No oxidation found on wire surface

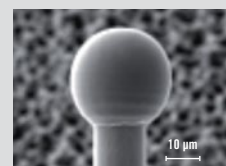
Bare Copper Wire



Severe oxidation found on wire surface

Consistent FAB roundness in N₂ environment

FAB Target: ~ 26µm,
Wire Diameter:
0.6 mil PdSoft,
Bonder: K&S Iconn,
EFO Current: 60 mA,
N₂ Gas Flow Rate:
0.3 ~ 0.5 l/min



FAB Target: ~ 40 µm,
Wire Diameter:
0.8 mil PdSoft,
Bonder: K&S Maxum Ultra,
EFO Current: 60 mA,
N₂ Gas Flow Rate:
0.3 ~ 0.6 l/min

