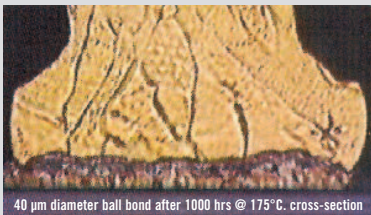
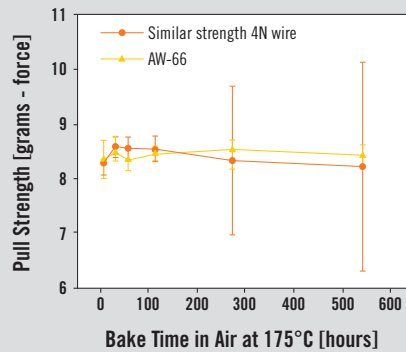
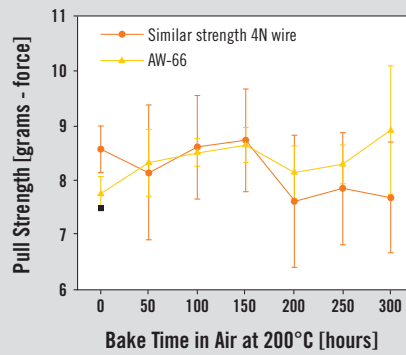


AW-66 4N Gold Ball Bonding Wire for High Reliability



AW-66 Thermal Aging Data



AW-66 Benefits

- Long-term stability of ball bonds through robust intermetallic growth
- Excellent bondability on a wide range of wafer metallizations
- Large process windows for 1st and 2nd bonds
- Versatile looping capabilities
- Applicable for wire diameter reduction programs (cost reduction)
- For ultra-fine-pitch applications – AW-66X with superior tolerances

Bonding Conditions:
23 µm wire diameter
Capillary: 414FF-2455-R33
40 µm ball bond diameter

AW-66 Mechanical Properties

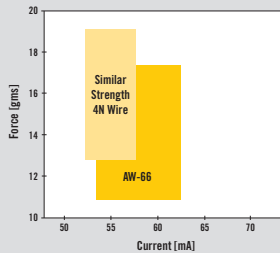
Diameter	Microns	15	16	17	18	19	20	23	25	28	30	33
	Mils							0.9	1.0	1.1	1.2	1.3
AW-66X						AW-66						
Recommended Specs for Ball Bonding												
Elongation (%)		2 – 5	2 – 5	2 – 5	2 – 6	2 – 6	2 – 6	2 – 6	2 – 6	2 – 6	2 – 7	2 – 7
Breaking Load (g)		3 – 6	3 – 7	4 – 7	4 – 8	5 – 9	5 – 10	8 – 13	10 – 15	12 – 18	14 – 21	16 – 24
Typical Breaking Load (g)												
Room Temp @ 4% EL		4.5	5.0	5.6	6.1	7.0	8.0	10.1	12.5	15.0	18.0	21.0
High Temp (250°C/20s)		4.2	4.7	5.3	5.8	6.6	7.5	9.5	11.8	14.3	16.9	19.9
In-Line Pad Pitch (µm)*												
Min. In-Line Pad Pitch		35	40	40	45	45	50	60	65	65	70	80

*Recommended pad pitch with corresponding wire diameter

AW-66 Characteristics (for 25 µm diameter wire)

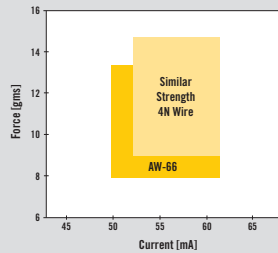
Non-Gold Elements	< 100 ppm
Breaking Load @ Room Temperature	> 12 g at 4% EL
Breaking Load @ 250°C / 20 sec.	> 11 g
Elastic Modulus	> 85 GPa
Heat Affected Zone (HAZ)	~ 120 µm (for 50 µm ball diameter)
Neck Strength	~ 11 g (at 50 µm ball diameter)
Melting Point	1063°C
Density	19.32 g/cm ³
Heat Conductivity	3.17 W/cm-K
Electrical Resistivity	2.3 µOhm-cm
Coeff. of Linear Expansion (0 – 100°C)	14.2 ppm / K
Fusing Current for 25 µm, dia 10 mm length (in air)	0.5 A

1st Bond Window on BOAC Die



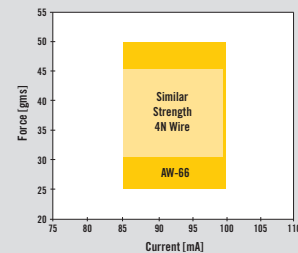
Bonding Conditions: 25 µm wire · BOAC die on BGA, T = 170°C
Ball diameter target 50 µm +/- 2 µm · Shear strength target > 6.0 g/mil² · IP coverage > 75% Squash height 10 +/- 2 µm

1st Bond Window on Conventional Die



Bonding Conditions: Al 1%Si 0.5%Cu, 1 µm over SiO₂ · 25 µm wire on BGA · T = 170°C · Ball diameter target 48 µm +/- 2 µm
Shear strength target > 0.6 g/mil² · IP coverage > 75% · Squash height 9 +/- 2 µm

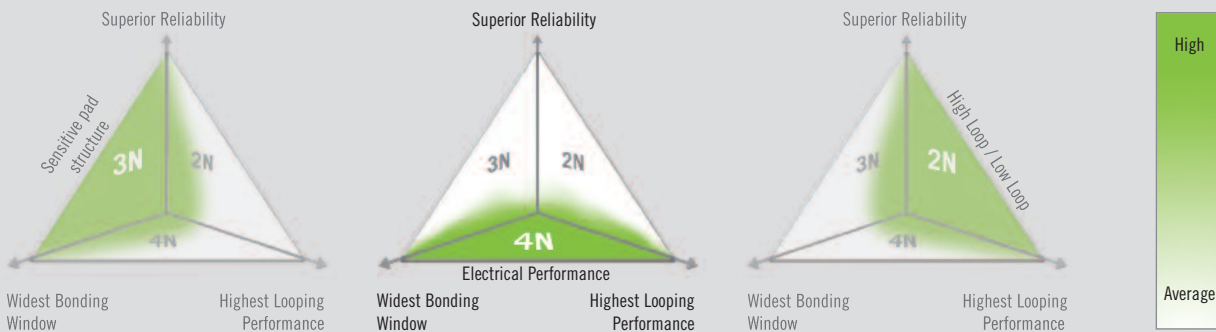
2nd Bond Window



Bonding Conditions: Capillary tip 3.4 mil, 25 µm wire on QFP, T = 200°C · Stitch pull target > 5 gram · No NSOL, optically acceptable crescent bond

Results may vary with package and die configuration, as well as bonding process

Gold Wire Segmentation by Properties



W. C. Heraeus GmbH

Contact Materials Division
Business Unit Bonding Wire
Heraeusstr. 12-14
63450 Hanau, Germany
Phone: +49 6181.35-5591
Fax: +49 6181.35-5179
bonding.wires@heraeus.com
www.heraeus-contactmaterials.com