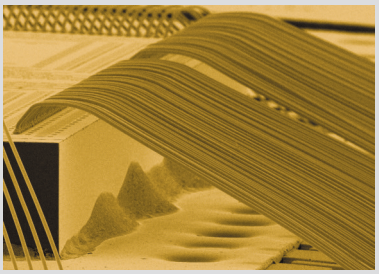
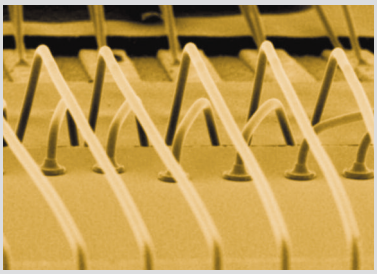
AW-99

Gold Bonding Wire for the Most Demanding Looping and Finest Pad Pitch





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

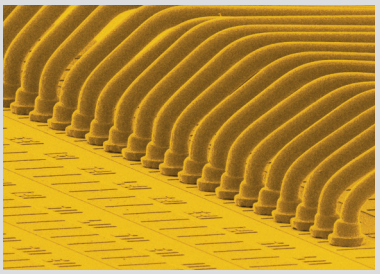
Application Data*

First bond results on optimum setting

	Ball Diameter (µm)	Squash Height (µm)	Shear Force (g)	Shear Strength (g/mil)
Mean	31.8	10.2	12.4	7.0
Std Dev	0.4	0.6	0.5	0.3
Min	37.5	9.0	11.7	6.56
Max	38.8	11.2	13.3	7.72

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

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.



Bonding Conditions: Wire diameter: 20 µm (0.8 mils) · Wire bonder: K&S 8028S · Package type: 320-lead PBGA · Die metallization: AlSi (1%) Cu (0.5%) · Wire span: 3.5 - 4.5 mm Loop Height Range: 150-165 µm · Bonding temperature: 170°C · Capillary: 414FF-2021-R33, T = 2.8 mil, FA 11°

Recommended Technical Data of AW-99

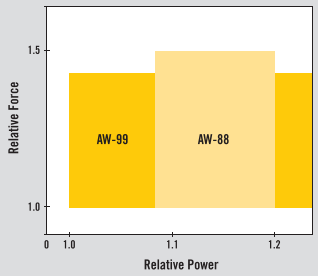
Diameter	**Microns**	15	18	20	23	25	28	30
	Mils	0.6	0.7	0.8	0.9	1.0	1.1	1.2
Recommended Specs for Ball Bonding								
Elongation (%)		2 – 5	2 – 6	2 – 6	2 – 7	2 – 7	2 – 7	2 – 7
Breaking Load (g)		3 – 6	4 – 8	5 – 10	7 – 12	9 – 14	11 – 16	13 – 20
In-Line Pad Pitch (µm)								
Min. In-Line Pad Pitch		35	45	50	60	65	70	80

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

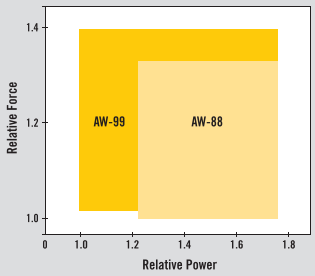
AW-99 Characteristics for 25 µm diameter

Non-Gold Elements	< 100 ppm
Elastic Modulus	~ 90 GPa
Heat Affected Zone (HAZ)	40 – 170 µm
Melting Point	1063 °C
Density	19.32 g/cm^3
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

Parameter Window for 1st Bond



Parameter Window for 2nd Bond



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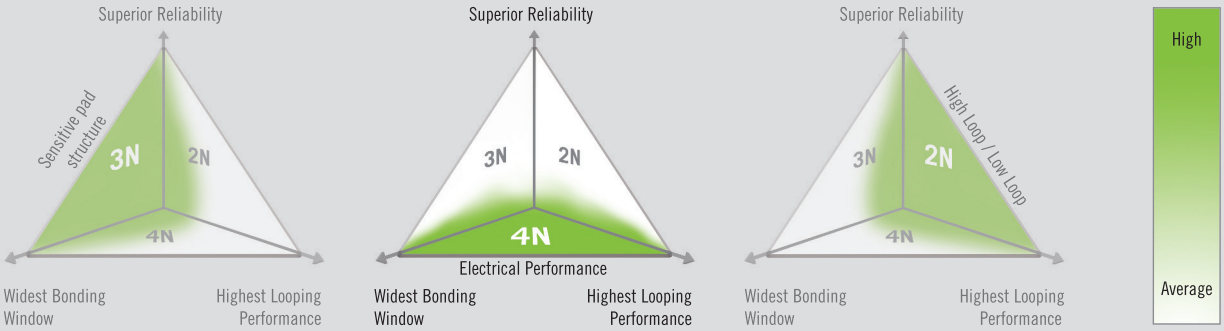
Gold Wire Segmentation by Properties



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