

## Au HA3 Low Loop • High Reliability • Bumping



In contrast to doped Au wires, alloyed wire types contain a low percentage of alloying elements. This results in markedly higher wire strength, shorter heat affected zones and better thermal stability without a significant increase in electrical resistance. The increased wire strength, while maintaining all other mechanical properties, permits a reduction of

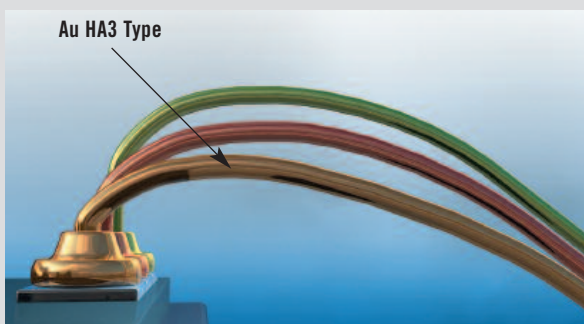
wire diameter together with a marked saving in precious metal costs.

Areas of application

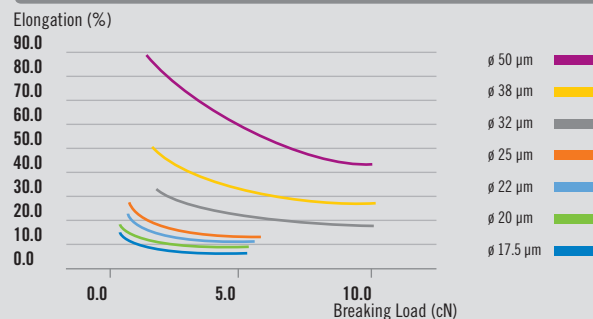
- High frequency bonding
- Low temperature bonding
- Low- and long-loop bonding
- High speed bonding
- Ultra fine pitch bonding
- Ball bumping

### Au HA3 Benefits

- High reliability wire type
- Increased strength, high loop stiffness
- Very good pull strengths and shear
- Long & low loop geometries
- Optimum stabilized phase formation
- High thermal stability



### Breaking Load vs. Elongation



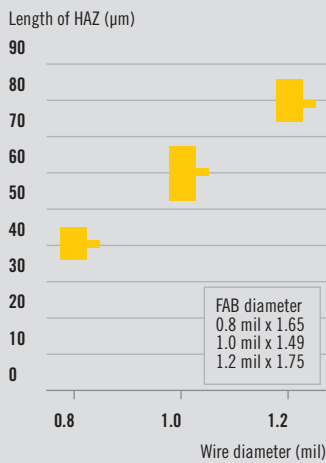
### Recommended Technical Data of Au HA3

| Diameter      | Microns (µm) | 17.5  | 20    | 23    | 25    | 30    | 32    | 38    | 50     |
|---------------|--------------|-------|-------|-------|-------|-------|-------|-------|--------|
|               | Mils         | 0.7   | 0.8   | 0.9   | 1.0   | 1.2   | 1.25  | 1.5   | 2.0    |
| Elongation    | %            | 2 – 5 | 2 – 5 | 2 – 8 | 2 – 8 | 2 – 8 | 2 – 8 | 3 – 8 | 3 – 10 |
| Breaking Load | cN           | > 5   | > 6   | > 8   | > 10  | > 15  | > 16  | > 22  | > 36   |

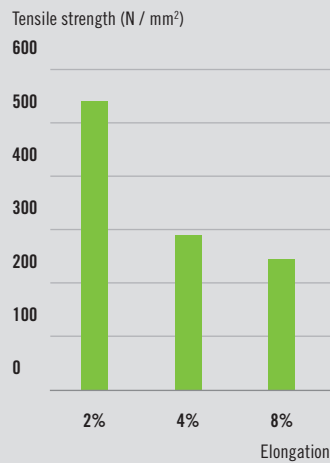
## Characteristics of Au HA3

|  |             |  |                           |
|--|-------------|--|---------------------------|
| <b>Non-Gold Elements</b>                               | < 10000 ppm | <b>Density</b>   | 19.28 g / cm <sup>3</sup> |
| <b>Breaking Load @ Room Temperature at 4% EL</b>       | > 12 g      | <b>Heat Conductivity</b>                                   | 3.03 W / cmK              |
| <b>Breaking Load @ 250°C / 20 sec</b>                  | > 11 g      | <b>Electrical Resistivity</b>                              | 2.8 μOhm-cm               |
| <b>Elastic Modulus</b>                                 | > 90 GPa    | <b>Coeff. of Linear Expansion (0 – 100°C)</b>              | 14.2 ppm / K              |
| <b>Heat Affected Zone (HAZ) on 50 μm ball diameter</b> | 60 μm       | <b>Fusing Current for 25 μm, dia 10 mm length (in air)</b> | 0.5 A                     |
| <b>Neck Strength at 37 μm ball diameter</b>            | 10 g        |  |                           |

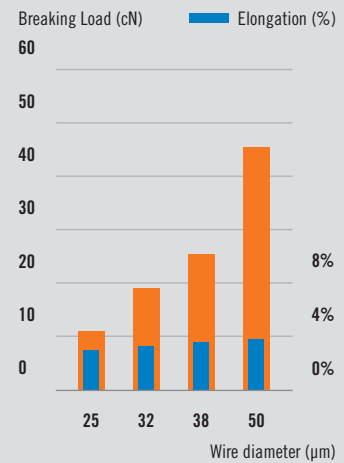
### Heat Affected Zone (HAZ)



### Breaking Load vs. Elongation



### High Temperature Strength (HTS)



## Gold Wire Segmentation by Properties



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