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DATA SHEET: Au90Cu10

Physical Property Information:

| | |
|--|-----------------------------------|
| Chemical composition | Gold 90 % (m/m), Copper 10% (m/m) |
| Purity | 99.99% minimal (m/m) |
| Solidus | 932°C |
| Liquidus | 948°C |
| Density | 17.18 Mg m ⁻³ |
| Coefficient of Thermal Expansion (CTE) | 15 ppm/°C (estimate) |
| Electrical Conductivity | 16% IACS |

Mechanical Properties:

| | |
|-----------------------------------|-----------|
| Ultimate Tensile Strength: | MPA (ksi) |
| “annealed” | 400 (58) |
| “cold worked” | 705 (102) |

| | |
|------------------|-------|
| Hardness: | HR15T |
| “annealed” | 76 |
| “cold worked” | 91 |

Typical impurity levels for the min. 99.99%-purity electronic grade alloy are less than:

| | | | | |
|--------------|-----------|-----------|----------|-----------|
| Sn .001, | Pb .002, | Ag .009, | As .003, | Bi .002, |
| Fe .002, | Ni .0003, | Cr .0003, | Mg .003, | Mn .0003, |
| Pd .005, and | Si .005. | | | |

Application information:

Au90Cu10 is used as a contact material in electronic devices, due to its high thermal- and electrical conductivity and its resistance against corrosion and sulfidation(S and H₂S) and freedom of ionic migration. Copper increases the hardness of gold with only a small sacrifice in corrosion resistance. Au90Cu10 is used in low-voltage dc devices such as alternators or voltage regulators, and as a positive contact paired with Pt-Ir negative contact. Under light closing forces, this combination provides a low transfer rate and good anti-welding characteristics.

In brazing applications, the alloy is used as filler metal for brazing stainless steel, tungsten, molybdenum, nickel and cobalt-base alloys. It is typically used for brazing thin sections, due to the low rate of interaction with the base metals. It is commonly used in applications where strength and corrosion resistance are needed at elevated temperatures.

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