



15 Mercedes Drive
Montvale, NJ 07645 U.S.A.
Telephone: 201.791.4020
Fax: 201.791.1637
www.coininginc.com



DATA SHEET: 78Gold-22 Tin

Physical Property Information:

Solder Alloy Composition	78Au-22Sn (weight per cent)
Melting range : Solidus	280°C
Liquidus	303°C
Density	14.18 Mg m ⁻³
Coefficient of Thermal Expansion (CTE)	14 ppm/°C
Thermal Conductivity	57 W m ⁻¹ K ⁻¹
Electrical Resistivity	16.6 μΩ cm

Mechanical Properties:

Ultimate Tensile Strength:	MPA (ksi)
23°C	269 (39)
120°C	170 (24.7)
165°C	136 (24)
190°C	90 (19.7)
Young's Modulus:	GPA (10 ⁶ psi)
23°C	59.2 (8.58)

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

Sb: 0.005, Pb: 0.005, Ni: 0.003, Al: 0.005, Bi: 0.005, Fe: 0.005, Zn: 0.005, As: 0.002, Cd: 0.001 and In: 0.005

Application information:

This alloy is applied when the substrates have a thick Au-flash (1-2μm) over the Ni-plating, which during the soldering process dissolves into the molten solder. In eutectic Au80Sn20 solder, the dissolved Au will cause the melting temperature to increase, which reduces the wetting/spreading of the solder alloy. The lower Au-content of the Au78Sn22 alloy will absorb the dissolved Au, while decreasing the liquidus temperature towards 280°C.

Like regular Au80Sn20 alloy, it is generally used for flux-less soldering, for which the soldering substrates materials are free of oxides and/or oily residues. Common practice for flux-free soldering is: Nickel-plated substrates (1.5-2.5μm) protected with an Au-flash (0.2-0.5μm) and soldering in vacuum, inert or N₂/H₂ atmosphere.

Soldering temperature for reflow (measured in the joint), should be minimal at or above 305-320°C for 20 seconds, depending the mass of the assembly and the type of furnace used. This assumes either very clean, soldering surfaces or the presence of a reducing agent (flux) or reducing atmosphere during the soldering cycle. If and when the components are slightly oxidized, a combination with flux or reducing atmosphere and higher temperatures and/or longer soldering temperatures is required.

The information contained herein is based on data considered accurate and is offered at no charge. No warranty is expressed or implied regarding the accuracy of this data. Liability is expressly disclaimed for any loss or injury arising out of the use of this information or the use of any materials designated.