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Data Sheet: 97 Indium-3 Silver

Physical Properties of Bulk Solder

Solder Alloy Composition	97In3Ag (weight per cent)
Solidus	144 °C
Liquidus	144 °C
Density	7.38Mg/m ³
Coefficient of Thermal Expansion	22.0 x 10 ⁻⁶ K ⁻¹
Tensile Strength	5.5 MPa
Young's Modulus	n.a. GNm ⁻² (low creep resistance)
Thermal Conductivity	0.73 W/cm.°C
Electrical Conductivity	23% IACS

Typical impurity levels for electronic grade are less then:

Au: 0.05	Cu: 0.08	Ni: 0.01	Al: 0.005
Bi: 0.10	Fe: 0.02	Zn: 0.003	As: 0.03
Cd: 0.002			

Areas of Application

97In3Ag will wet glass, quartz and many ceramics. Therefore they find use in glass-metal seals; also, because of their low vapor pressure, they are useful as seals in vacuum systems. They retain their plasticity down to liquid-helium temperatures and thus can be used for sealing cryogenic systems. High-In solders are very ductile and therefore have low creep resistance. The Ag-addition helps but tensile-strength values are still lower than Sn-Pb-based solders.

In-based solders have a good resistance to alkaline corrosion. However, corrosion resistance in the presence of traces of halide ions is not satisfactory, necessitating the use of hermetic seals or conformal coatings.

Soldering temperature for reflow should be minimal at or above 180°C for a minimal time of 40 seconds. If lower reflow temperatures are needed, it must be compensated with additional time-above-temperature. This assumes either very clean, soldering surfaces and an inert or reducing atmosphere or the presence of a deoxidizing agent/flux during the soldering cycle. If and when the components are slightly oxidized, a combination with higher temperatures and/or longer soldering temperatures is required. For more oxidized surfaces, an appropriate flux must be used.

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