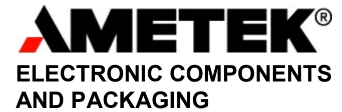

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Data Sheet: 96.5 Tin-3.5 Silver

Physical Properties of Bulk Solder

Solder Alloy Composition	96.5Sn-3.5 Ag (weight per cent)
Solidus	221°C
Liquidus	221°C
Density	7.37 Mg m^{-3}
Hardness	14.8 HV
Thermal Conductivity	50 W $m^{-1}K^{-1}$
Electrical Conductivity	14 % IACS
Electrical Resistivity	12.31 μΩ cm
Coefficient of Thermal Expansion	21.6 ppm (20 °C)

Mechanical Properties: Tensile Strength

			20°C	100°C
Test speed	50 mm min^{-1}	Stress, Nmm^{-2}	51.2	36.7
	20		56.8	31.4
	5.0		43.7	30.4
	1.0		44.1	28.0
	0.2		41.9	26.6
	0.05		36.3	24.2

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	In: 0.10

Application: Soldering temperature profile for flux-less, reflow applications should include: minimal at or above 250°C for a minimal time of 20 seconds. This assumes either very clean soldering surfaces or the presence of a reducing- or inert-atmosphere during the soldering cycle. Alternatively, the alloy can be reflowed below 250°C when special conditions for substrates (i.e. Au-plating over Ni-) and longer temperatures above melting point are being met.

If and when the components are slightly oxidized, a combination of higher temperatures and/or longer soldering temperatures is required. When flux can be used, the temperature profile can usually be kept shorter. In such situation, the peak temperature of the profile can be lowered to 235°C for a minimal time of 20 seconds above melting point of 221°C.

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