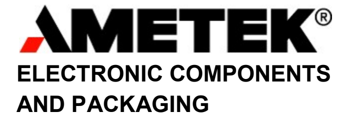

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Data Sheet: 50 Tin-32Lead-18Cadmium

Physical Properties of Bulk Solder

Solder Alloy Composition	Sn50Pb32Cd18 (weight per cent)
Eutectic melting point	145°C
Density	8.5 Mg/m^3
Coefficient of Thermal Expansion	$13.2 \times 10^{-6} K^{-1}$
Hardness	14 HV
Thermal Conductivity	$60 W m^{-1}K^{-1}$ (est.)
Electrical Conductivity	13.3% IACS

Mechanical Properties: Tensile Strength (Stress, Nmm^{-2})

		20ºC	100ºC
Test speed	20 mm min^{-1}	44-49	21-29
	10	38-45	13-23
	1.0	23-36	15-20
	0.5	27-44	17-20
	0.1	20-27	10-11

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
In: 0.10			

Application: Soldering temperature for reflow should be minimal at or above 210ºC for a minimal time of 20 seconds. 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.
The cadmium addition, increases the susceptibility to surface oxidation during shelf life as well as during the soldering cycle. This means that during flux-free soldering, the oxygen level of the soldering atmosphere should be below 20 ppm O_2.

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