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ELECTRONIC COMPONENTS  
AND PACKAGING

## **88 Lead - 10Tin - 2Silver**

### **Physical Properties of Bulk Solder**

Solder Alloy Composition	88Pb-10Sn-2Ag (weight per cent)
Melting range	268-290°C
Density	10.75 Mg/m <sup>3</sup>
Thermal conductivity	27 W/m K <sup>-1</sup>
Electrical conductivity	8.5% IACS
Coefficient of Thermal Expansion	29.1 x 10 <sup>-6</sup> K <sup>-1</sup>
Tensile strength (est.)	22.48 G Nm <sup>-2</sup>

Typical impurity levels for electronic grade are less than:

Au: 0.05	Cu: 0.08	Ni: 0.01	Al: 0.0005
Bi: 0.001	Fe: 0.02	Zn: 0.0003	As: 0.0003
Cd: 0.002	In: 0.10		

**Application:** The 88Pb10Sn2Ag-alloy is used for the manufacture of semiconductor components. It combines a high melting range, with good mechanical strength and thermal fatigue properties. The 10% tin and the 2% Ag additions assure a good wetting to copper or nickel leads/substrates and Au-flash coated Si-chips in diode- and/or die-attach applications. The melting temperature range is wide enough to permit two- or even three-step soldering. The higher melting range makes the alloy also very suitable for fluxless soldering in an inert or reducing atmosphere.

The 10% Sn solder is a high-temperature silver-bearing solder with good thermal fatigue properties. It is used in the assembly of diodes and rectifiers in belt furnaces with a forming gas mixture (N<sub>2</sub>, H<sub>2</sub>) or cracked anhydrous ammonia (75%H<sub>2</sub>, 25%N<sub>2</sub>).

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