



Lead Free solder alloy G501

With the introduction of Tin/Copper/Silver alloys used for Lead Free soldering of electronic assemblies, there have been major increases in the costs of the three constituents. The highest priced element in the most common alloys is Silver, which despite its relatively low percentage, generally in the range of 3 – 4%, represents more than 50% of the cost.

Alloy **G501** has been formulated in order to offer a lower cost alternative without affecting the integrity of the solder joint.

G501 wets well and gives excellent joint strength. It can be used with existing equipment, processes, fluxes, and coatings
It has a melting range of 217-227 °C and a recommended pot temperature of 260° C.

Solder Bath Temperature

During the soldering process, copper levels in the bath tend to increase as copper leaches from both the boards and the components. This results in an increase in the liquidous temperature of the alloy, and a rise in the operating temperature required in order to obtain the same level of productivity. It is therefore essential that analysis of the solder bath contents is regularly undertaken to ensure that the Copper level does not exceed 1.1%.

The rate at which an alloy dissolves copper is important in maintaining good wave solder control. Each 0.1% increase in the Copper level increases the liquidous by 1.9°C

It is therefore essential that the solder bath is regularly tested for Copper content. As a rule of thumb, expect the Copper content in the bath to increase by 0.01% every 1000 boards.

Note

The various world standards for Lead Free solders allow the Lead level in Lead Free solders to be a maximum 0.1%. The Lead level in G501 is considerably lower, normally being in the range of 0.02 – 0.04%.