



## TECHNICAL DATA

# Fenix 100 and Fenix 100T Alloys

### **DESCRIPTION**

Fenix 100 is a modified tin-copper solder with 0.7% copper, which has been specially processed to refine the normally dendritic structure found in Sn99.3Cu0.7 alloy. Like other tin-copper alloys, it is safe to use and has low environmental impact. It is lighter than the tin-lead alloys it replaces.

Fenix 100T is the top-up alloy suitable for baths of Fenix 100 likely to dissolve copper and is used to counteract the increase in copper content of the bath.

As Fenix has its own refinery, alloy quality can be ensured throughout the manufacturing process.

### **APPLICATIONS**

Fenix 100 is suitable for hot air solder levelling (HASL) of bare circuit boards and for wave soldering of electronic assemblies, particularly for consumer products. In these applications, it replaces Sn63Pb37 and Sn60Pb40 alloys. Although the metal cost is higher, this is partly compensated for by the alloy's lower density and is, in any case, less than that of silver containing solders.

The refined structure of the alloy gives it increased fluidity, as it is about to solidify, minimising the soldering temperature and reducing the incidence of bridges. Owing to the increased fluidity of Fenix 100 compared with Sn99.3Cu0.7, it can often be hot air levelled at temperatures as low as 260°C.

For wave soldering, temperatures of 260-270°C are usual. The topside pre-heat needed will vary with the particular thermal requirements and complexity of the assembly but is normally between around 100°C, for single sided and light double sided boards, and around 130°C for thick multi-layer boards and those with heavy components.

### **COMPOSITIONAL CONTROL**

The higher solder bath temperature and high alloy tin content result in an increase in copper dissolution from the circuit board and component legs. The bath composition should be monitored for copper content, as the rate of dissolution may not be balanced by the rate of new metal addition. If it rises above 1%, the liquidus temperature will rise significantly and the defect rate will increase. To counteract this, the top-up alloy, Fenix 100T, may need to be added to the bath to maintain a satisfactory copper equilibrium. This has been formulated to maintain the performance benefits of the original solder.

### **HEALTH AND SAFETY**

Please refer to the Safety Data Sheet for full safety and handling instructions.

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## **TECHNICAL DATA**

<b>PROPERTY</b>	<b>Fenix 100</b>	<b>Sn63Pb37</b>
<b>Melting Point (°C)</b>	<b>227</b>	<b>183</b>
<b>Density (g/ml)</b>	<b>7.3</b>	<b>8.42</b>
<b>Electrical Conductivity (%IACS)</b>	<b>13</b>	<b>11.9</b>
<b>Surface Tension at liquidus +50°C (mN/mm)</b>		
- in air	<b>491</b>	<b>417</b>
- in nitrogen	<b>461</b>	<b>464</b>
<b>Hardness (HV)</b>	<b>9</b>	<b>17</b>

## **SPECIFICATION**

Fenix 100 and Fenix 100T are made to proprietary internal specifications. Fenix 100 meets the specification for S-Sn99Cu1, alloy number 401, of the international solder specification ISO 9453 - Soft solder alloys – Chemical compositions and forms. Fenix 100T, without copper, is made to the same purity standard. The typical lead content of these alloys is less than 0.05%.

## **PACKAGING**

Fenix 100 and Fenix 100T are available as nominal 1kg bars packed in 25kg cartons. Other forms, pellets, sticks, ingots and autofeeder wire can be made available subject to quantities required.

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