



LEAD FREE SOLDER ALLOYS

On 8th November 2002, a directive from the European Parliament adopted a proposal for a directive on Waste Electrical and Electronic Equipment, WEEE, as well as a proposal for the restriction of the use of certain hazardous substances in Electrical and Electronic equipment.

The directive requires the substitution of various heavy metals and brominated flame retardants in new electrical and electronic equipment from 1st July 2006 onwards.

Most of the classical alloys used in soft soldering are causing concern under the directive due to their high lead content.

Producers will be responsible for taking back and recycling electrical and electronic equipment which should have no more than 0.1% Lead content in the product in total.

In light of this new directive, MBO offer the following "Lead Free Alloy" alternatives in line with industry recommendations.

General Characteristics:

A range of **Lead Free Solder Alloys** for use in the assembly of electronic and electrical components in printed circuit board processes. Produced from very high quality, virgin metals and smelted under a nitrogen atmosphere. The manufacturing process minimises the formation of superficial oxides during production. These alloys provide alternatives to the traditional Leaded Alloys currently in use in turn ensuring solder joints formed remain bright and free of soldering defects through minimising defects such as bridges, flags and spikes during the soldering process.

Lead Free Alloys may be used in conventional wave soldering machines and solder pots without the use of a nitrogen blanket although maximum advantage can be gained from **Lead Free Alloys** when flow solder machines are fitted with a nitrogen blanket facility in some instances.

It should also be noted that degradation of the solder pot will be more evident than before and as such it is advisable that companies discuss this phenomena with their equipment supplier.

These alloys exceed the requirements laid down in International Standards to include: **NFC 90550, DIN 1707, B.S.219, BS EN Alloys and J-std 006.**

Chemical Characteristics

Metals from first smelting.

Amount of Tin:	% +/- 0.2%
Amount of Copper:	% +/- 0.2%
Amount of Silver	% +/- 0.2%
Purity Rating:	>99.95%.

Physical Characteristics, standard:

Melting point	Solidus to Liquidus @ See alloy table.
Specific weight	7.3 – 7.4
Working temperature	260 to 490°C depending upon the alloy and the process

Alloy	Melting point
Sn96.5Ag3.5	E – 221 C
Sn96Ag4	E – 221 C
Sn99.3Cu0.7	E – 227 C
Sn99CuP	E – 227 C
Sn92Cu8	S 230 – 350 C
Sn97Cu3	S 227 – L 320 C
Sn95.5Ag3.8Cu0.7	E – 217 C
Sn96.5Ag3.0Cu0.5	S 217 – L 219 C
Sn95Sb5*	S 232 – L 240

* N/A



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Chart of maximum impurities, example:

Pb	Cd	Sb*	Bi	Fe	Zn	Al	As	S	Cl	P
<0.05%	<0.001%	<0.01%	<0.01%	<0.01%	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001

*N/A

Others
<0.05%

Supplied as:

Bars	Extruded Bars in cartons of 20 - 25kgs.
Sticks	Cartons of 20 - 25kgs.
Granules	Containers of 20kgs.
Ingots	Approximate weight of around 3 – 4kgs
Wire	On spools of 250gms, 500gms, 1kg, 3kg and 20kgs. Drum packs are also available as 20 – 25kgs per pack.
Paste	Jars, Cartridges and Syringes

Storage:

Original packaging at a temperature of 20°C for 12 months minimum.
Paste requires special storage conditions – see product data sheet.