Weller

Product-Information

Lead Free Soldering with Weller Tools

Why Lead Free?

Based on the global ambitions of pollution prevention, starting from July, 1st 2004, the European Community laws request to use only lead free tin for soldering.

Particularities of Lead Free Solder

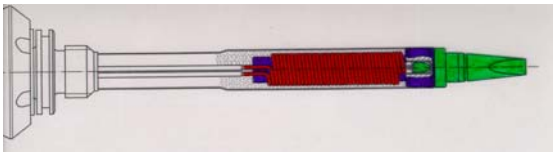
New alloys are needed and in general the melting point is increasing. Mainly Tin (Sn) - Cupper (Cu) (227°C), Tin - Silver (Ag)(221°C) or Tin - Silver - Cupper (217°C) are used, whereby the eutectic conduct need to be kept in mind. Occasionally Bismuth (Bi) is added for further reduction of the melting point. Those alloys are critical, since few contaminations (rest of solder on PCB, lead containing connectors of components) reduce the melting point dramatically and may cause quality and stability problems.
Lead free solder downgrades the process ability because of lower wetting and flow behaviour. This can only be solved by the use of improved flux.
Compared to lead containing solder, lead free solder joints appear dull and are additionally temperature sensitive.
An increase of process temperature should be avoided since due to longer cooling times microcracks may occur. Soldering with higher temperatures can result in black layers on the tip which make them unwettable and cause early fallout (charred flux, oxidized tin, tin-iron-fusions).
New materials like lead free alloys demand new tools.

Requirements on Hand-Operated Solder Tools

Due to higher melting points, working with lead free solder requires:

- Tools with higher power and optimised temperature control
- Tools with better thermal conductivity, to bring the heat lossless to the tip of the iron
- Optimised tip selection. More short and thick tips are preferable to transfer the needed heat into the solder joint without increasing the process temperature. Thermal stress on components and PCBs are reduced and the solder tip is prevented from damage (lifetime, wettability)
- Cost reduction of wear parts

Due to the higher tin rate lead free solder causes shorter lifetime of the tip (Iron – leaching). The Weller system stands out of low wear consumption. Due to separation of high-value heater / sensor and tip, only the tip need to be changed of wear. The Weller „LF“ (Lead Free) tips additionally have an optimised thicker layer of iron. This results in higher lifetime and still ensures perfect heat transfer.



The integrated heating element features an effective thermal energy transfer towards the solder tip. This allows during the soldering process a consistent temperature of the tip at the solder joint.

Hints for Soldering

- For rework and repair use the same alloy that is used for the production of the boards
- Select the working temperature as low as possible
- Choose the biggest possible tip form for your task
  rule of thumb: about the size of the solder pad
- Make sure to realize an extensive heat transmission between tip and solder joint thru a
  well wetted tip
- Soldering in an inert gas environment increases the flow behaviour and reduces the need
  of flux; don't use more flux as needed
- Work with soldering tools that offer high power and a perfect thermal transfer
- Use an intelligent solder station with optimised temperature control and setback function
  to reduce the tip temperature in case of no use
- Preheat the boards with heating plates before repairing to reduce the soldering time
- It is recommendable to make sufficient tests and to set-up a detailed flow chart in which steps the changeover to lead free era takes place

Treatment of the Solder Tip

- Clean the tip on a watery swamp (not dry nor wet)
- Use original swamps and distilled water
- Switch off your station during longer working breaks or use the Weller setback function
- Add sufficient tin to the tip before placing the iron into the stand
- Unwettable tips are reactivated with a Tip-Activator
- Use the lowest possible tip temperature
- Use special tips for applications with drag drop (GW-Gull Wing or KN-Knife tips)
- Apply the tin direct to the solder joint not the tip
- If possible avoid the use of high activated flux
- Change the tips with the appropriate changing tool
- Apply as less force as possible onto the tip
- Pay careful attention to the tip
- Black layers of oxidized tips can be softly removed with steel or aluminium wool

Benefit from our knowledge and experience.
We gladly support you to facilitate your start into this new technology.

Tools that Facilitate your Work when Soldering with Lead Free.

The Weller solder irons WSP and WMP are accurately adjustable to every solder task.
Those adjustments can be calibrated and audited according to ISO standards.

WMP Solderiron

Ergonomically designed - very short grip to tip distance
Efficient - improved heat transmission
Economic - mechanic separation of tip and heating element

WSP 80 Solderiron

The proven and tested tool for lead free soldering in production and repair. Ideal for production lines with continuous use.

WSP 150 Power Solderiron

The tool for lead free solder tasks with high demand of power.
Low loss transmission of high power and big thermal capacity of the tip enable continuous working.
Increased temperature range up to 550°C!

WSP 80 IG Innert Gas Solderiron

The perfect tool for lead free soldering in an inert gas atmosphere with approved 80W technology.

WHP 3000 Heating Plate

Temperature adjustable bottom heat of up to 600W for sparing preheat of the repairs to reduce the solder time and thermal stress of the board.