



Product Information

Lead Free Soldering with Weller Tools

Why Lead Free?

Based on the global ambitions of pollution prevention, starting from July, 1st 2006, the European Community laws request to use only lead free tin for soldering.

Why Weller?

Weller has a long experience with lead free solder. Our customers in Japan and China are successfully working with Weller soldering equipment and lead free solder since many years. The Weller Silver Line technique has proven its quality and performance. Your company should benefit as well from our knowledge and experience.

Particularities of Lead Free Solder

New alloys are needed and in general the melting point is increasing. Mainly Tin (Sn) - Copper (Cu) (227°C), Tin - Silver (Ag)(221°C) or Tin - Silver - Copper (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.

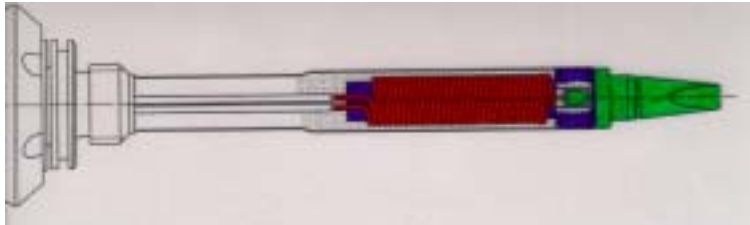
Compared to lead containing solder, lead free solder joints appear dull and are additionally temperature sensitive during hardening. An increase of process temperature should be avoided due to longer cooling times may cause micro cracks. Soldering with higher temperatures can result in black layers on the tip which make them unwettable and cause early fallout (charred flux, oxidized tin, tin-iron-fusion). Thus, 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 soldering 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 (e.g. with WSP 80IG) 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 soldering station with optimised temperature control and setback function to reduce the tip temperature in case of no use
- Preheat the boards with heating plates (e.g. WHP 3000) 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 Soldering 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
- Unwetable tips are reactivated with Weller 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

Tools that Facilitate your Work when Soldering with Lead Free Solder

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

WMP Soldering Iron

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



WSP 80 Soldering Iron

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



WSP 150 Power Soldering Iron

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 Inert Gas Soldering Iron

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



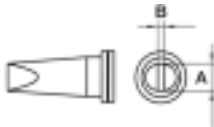





WHP 3000 Heating Plate



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

Soldering Tips for Lead Free Solder

Regular soldering tips can be used with lead free solder but it reduces their lifetime for physical reasons. The new „LF“ tips have a thicker layer of iron. This improves the lifetime and makes them ideal for working with lead free solder.

Description		Width A	Thickn. B	Model	Order No.
Chisel tip		1,6 mm	0,7 mm	LT ALF	005 44 470 00
		2,4 mm	0,8 mm	LT BLF	005 44 446 00
		3,2 mm	0,8 mm	LT CLF	005 44 447 00
		4,6 mm	0,8 mm	LT DLF	005 44 448 00
Long chisel tip		2,0 mm	1,0 mm	LT LLF	005 44 476 00
		3,2 mm	1,2 mm	LT MLF	005 44 477 00
Round tip		1,6 mm	-	LT ASLF	005 44 471 00
		3,2 mm	-	LT CSLF	005 44 474 00
Round tip spade		2,4 mm	4,0 mm	LT BBLF	005 44 472 00
		3,2 mm	6,0 mm	LT CCLF	005 44 473 00
		4,6 mm	6,0 mm	LT DDLF	005 44 478 00
Gullwing		2,3 mm	3,2 mm	LT GWLF	005 44 475 00
Knife tip		6,3 mm	-	LT KNLF	005 44 479 00

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

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