

10.1 Welding Silver

1 Because of its physical makeup silver is difficult to weld, no matter what sort of welding equipment you use.



Its high heat conductivity makes working with this metal particularly problematic. This is why the welding spots tend to be smaller and not as deep.



2 When working with small or thin parts this effect is less pronounced, this is because the volume of metal is missing. A high metal volume would conduct the heat and direct it away from the working area too quickly. This is why the PUK produces very good results with loops or thin silver pieces.

(fig.10.1)



fig. 10.1

3 If you then try to avoid the problem of high heat conductivity by using a higher power setting, the metal will overheat locally. Because of its low melting point, holes in the work piece are the result.

In this case, the metal liquefies but is sprayed away from the welding area, leaving craters. If a PUK 3 Pro Plus is used, you can set the power as high as approx. 45% when working with Silver; a higher power may have negative effects. (This is equivalent to approx. 60% power on PUK 3 professional.)

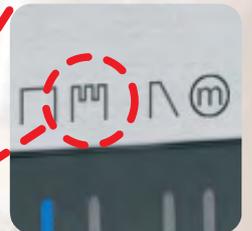


fig. 10.2

4 With the specially modulated "Silver impulses" built in to the PUK3 and the PUK3s, energy can be applied to the metal in a controlled way. This way the annoying physical qualities of silver alloys are largely compensated.

These modes allow you to produce clean and stable welds, even when working with silver.

(fig.10.2 & 10.3)

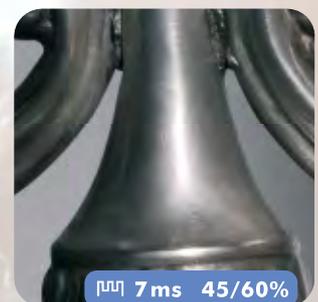


fig. 10.3





fig.10.4

5 Note that here the penetration depth (into the metal) is less than with gold or steel. You should take this into consideration when planning your work and whenever possible "PUK weld" from both sides, or make a "V-joint".

(fig.10.4)

6 It may be advantageous to weld larger silver pieces with a longer impulse time (12 - 18msec.), as this will have a positive effect on the structure of the metal.

10.2 Adding material when working with silver



fig.10.5

7 When adding metal on silver, a slightly shorter impulse time is recommended! (5msec.)

In many situations it's helpful to work with some sort of extra material, for instance welding wire. Not only when filling pores but also when welding larger work pieces. This induces greater penetration depth and stability of the weld.

And tacked work pieces even hold when subjected to extreme heat tension.

(fig.10.5)



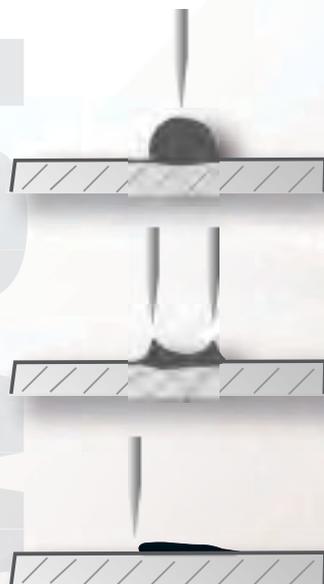
fig.10.6

8 As a general rule you should choose a welding wire between 0,2mm and 0,4mm in thickness. Note that the thicker the wire is, the more power will have to be used.

The forming and modelling of "added material" that we know from our work with gold alloys is not possible here as silver cools too quickly. Because of its physical properties, molten silver is in most cases pushed away from the welding joint by the welding energy used. This is why when working with silver, the technique is exactly the opposite of that when working with gold alloys – we can drive the molten metal before us using the tip of the electrode.

Using this technique added material that has been built up too high, can be flattened. To do this increase the power slightly and place the electrode tip almost vertically over the mound of added material.

(fig.10.6)





9 You can use the same process to smooth the metal. This time use a little less power and put the electrode vertically next to the "mound of silver".

Thus the added silver and the base material are both melted and a strong, smooth mass is produced.

(fig.10.7)



fig.10.7

Tips:

- 1** It is worth remembering that silver is easier to weld when it's warm; because with increasing temperature, its high heat conductivity is less of an influencing factor. Whenever possible, place several welds in quick succession, in order to warm up the area that is to be welded.

This technique is especially useful for PUK2 users, as this machine doesn't have a special "silver mode". Possibly you'll have to hold the work piece with pliers, tweezers or similar tools. Very sensitive stones should be cooled with a damp cloth. Having said this, our extensive testing has shown that even a small silver ring of approx. 3g, only reached a max. temperature of 120°C (250°F) during welding using this technique.

(fig.10.8)



7ms 50/60%

fig.10.8

- 2** As a general recommendation we would advise using welding wire (no thicker than 0,3mm) of the same alloy / metal as the work piece . An even better bet are the welding wires from Lampert for optimum performance.

(fig.10.9)

PUK 2 users should use "impulse 2" and an average power setting for the best results. Take though into consideration that the PUK 2 is more suited to thinner silver work pieces or tacking.



fig.10.9

