

## Welding time (pulse duration)

Basically the welding time is responsible for the penetration depth of the welding spot and thereby for the heat input into the workpiece. Hence, it must be observed when small material thickness and heat sensitive materials like gemstones are involved. Especially the new PUK 4 and PUK 5 series provide extremely short welding times starting from 0.5 ms. With this, the work on sensitive pieces and directly next to gemstones or sensitive materials like even plastic is feasible without any problem.



### 1. The settings

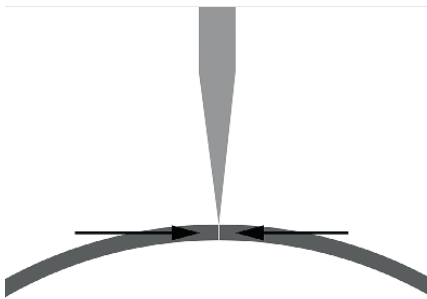
For the following applications the standard mode for small material thickness is appropriate within a range of 15–25% power and 0.5–1.5 ms welding time.

Basically it is advisable to start with lower settings and increase stepwise when needed. The electrode must be very sharp at all times, to concentrate well the low energy.



### 2. Fine wires

Short welding times allow very accurate and precise welding spots, as shown here on fine wires.



### 3. The welding point on wires

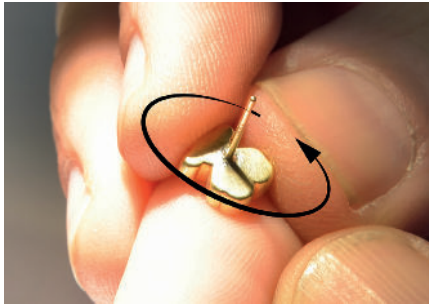
A good fit and contact between the wire ends is important. The ends are being held together with slight pressure. With a single welding spot the ends will be joined.



### 4. Hollow parts with small material thickness

Welding is particularly appropriate for joints on electroformed parts because the required material hardness will be preserved. Since the material thickness is only around 0.2 mm in most cases, it must be welded with very short welding times to not to damage the piece.

In the following steps ear posts will be fixed and holes will be filled.



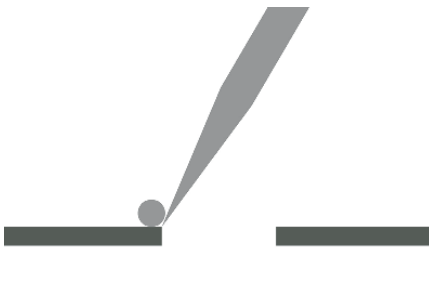
## 5. Welding ear posts

With the same settings as before and an electrode angle of 45° between ear post and base the ear posts are being welded around.  
See also workshop no. 3.1 / 3.1 "Ear post".



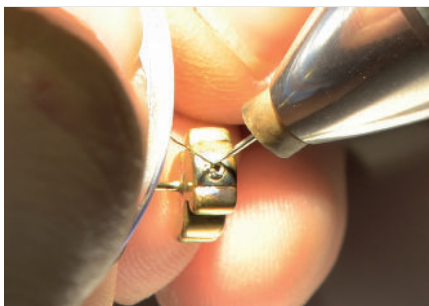
## 6. Low-energy material adding: the settings

For adding material the prong retipping mode is well suitable, again in a range between 15–25 % power and 0.5–1.5 ms welding time.



## 7. Reinforcing the edge

The electrode must be sharpened again.  
Welding wire made from the same material as the work piece and in a diameter of approx. 0.25 mm is being welded at the edge, to provide reinforcement.



## 8. Adding material

Afterwards the hole is being filled gradually.  
The reinforced edge makes the material addition more easy, the settings of power and welding time can be slightly increased.



## 9. Welding close to heat-sensitive materials

The settings as mentioned before are also suitable for adding metal close to heat-sensitive materials. On this ring with an amber a crack in the bezel setting has been filled.  
Again, it is advisable to start with lower values and increase stepwise when needed.  
After successful repair the weld can be cleaned up with little effort.