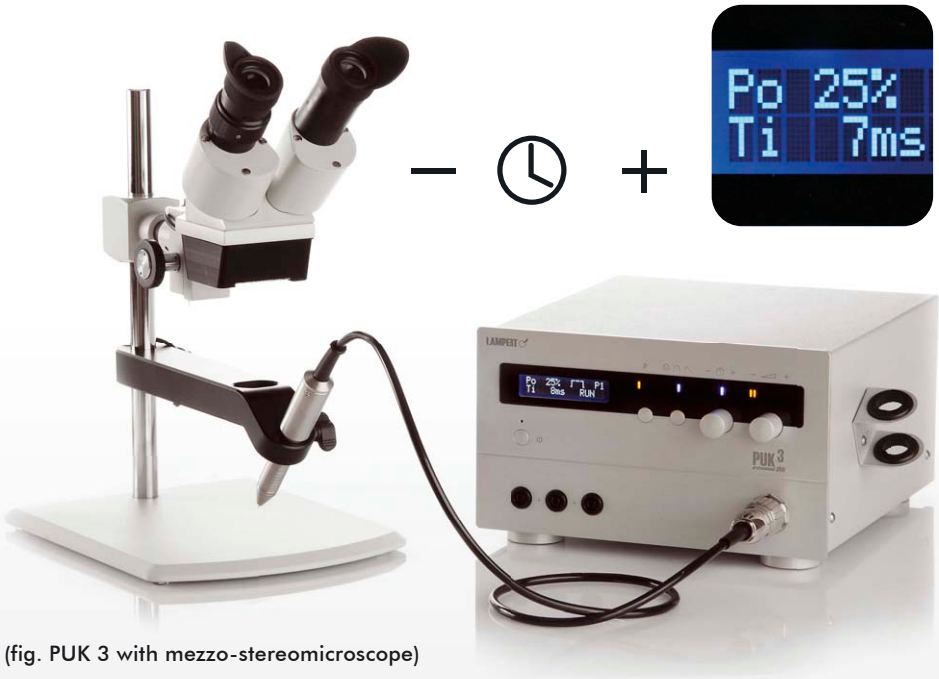
15.1 Impulse Times

1 With our PUK3 and PUK 3s series, as well as regulating the power, the impulse time can also be adjusted. This means the duration for which the power should operate.Though the PUK only produces individual “points”, how long the electric arc affects the welding area, is nevertheless an important deciding factor.

In the display, the impulse time is shown with "Ti" (Time). The standard time is "7 ms" (milliseconds).

With the PUK2, the impulse time can also be adjusted. The impulse button can be changed between impulse I (~7 m/s) and impulse II (~18 m/s).



(fig. PUK 3 with mezzo-stereomicroscope)

(fig. PUK 2)

2 Whereas the power controls the size of the welding spot, a changing of the impulse time primarily affects the penetration depth of the weld.

Additionally, with silver, using a slightly longer impulse time (12-18ms) a better surface can sometimes be obtained.

The High-Frequency-Mode (HF-Mode) on PUK 3s is often used with a longer impulse time. This way, the high-frequency oscillation has more time to take effect.

(fig. 15.1)

Changing the impulse time can also lead to better results when working with non-precious metals, for example with costume jewellery, there are some alloys that are easier to weld using longer impulse times, others where a shorter time is more successful.

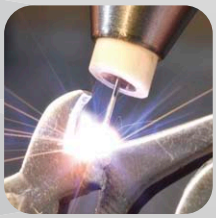
(fig. 15.2)

The improved penetration depth can be especially useful with pieces that can only be welded from one side, e.g. broken latches.

(fig. 15.3/15.4)

In practice, most welds are carried out either with the standard time of 7ms (Impulse I), or using an as short an impulse time as possible.

(fig. 15.1)



(fig. 15.2)

(fig. 15.3/15.4)

15.2 Impulse Times

(fig. 15.4)

(fig. 15.5)

3 With shorter impulse times, not only is the penetration depth less, but also the risk that sensitive materials are damaged or that thin work pieces melt away.

(fig. 15.4)

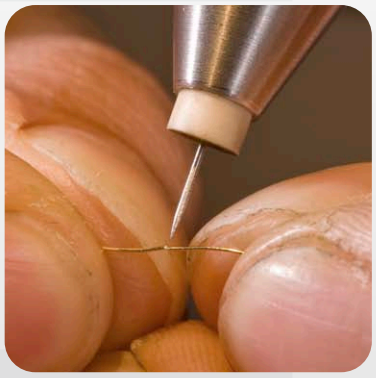
Shorter impulse times allow therefore, work to be carried out on thin walled hollow pieces, or repairs to be carried out immediately adjacent to stones.

(fig. 15.5)

When working in immediate proximity of heat sensitive materials or on particularly thin work pieces, always choose the shortest possible impulse time (4 ms)

A typical setting is Micro mode

Micro | Ti: 4 ms | Po: 5 - 15%.



(fig. 15.6)

4 With such low settings it is essential to pay attention to the condition of the electrode tip.

Even a slight soiling of the electrode tip can interfere with the welding process.

This "soiling" can in extreme cases be so fine, that it is not even visible under the microscope.

Sometimes with these very fine welds, the electrode will have to be re-sharpened after less than 10 welding spots.

(fig. 15.6)

5 A certain degree of caution should be applied when changing the impulse time, because for the majority of jobs, the standard impulse of 7 ms is ideal. Longer impulse times can, in some cases, also have a negative affect.

Because with increased duration, welding spots oxidise more, the likelyhood of pores is increased, some metals also tend to become brittle. Another possibility is that work-pieces will not join, because the surface-tension of the molten metals are pulled away from each other.

In addition, the work-piece heats up faster as with every impulse, more energy is introduced.

In most cases, instead of using longer impulse times to penetrate deeper into materials, a v-groove can be filed.

This can then be filled back using a wire; a routined "PUK-user" achieves better results with this method whilst investing only a minimum of extra time and effort.

See also Workshops 2 and 5 for additional information.