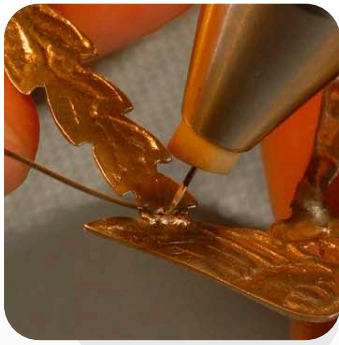


# 14.1 Protective Gas



**1** When welding with the PUK it is vital to use protective gas (inert gas). This has two reasons,

- It minimises oxidation and the appearance of porosity, and thus makes stable welds possible. Additionally it is responsible for the smoothness of the welded surface.
- During PUK-Welding, the protective gas is also responsible for transporting the welding energy. It forms an electrically conductive plasma that is also known as an "arc". Depending on the gas used, the arc will have a varying heat conductivity and diameter.

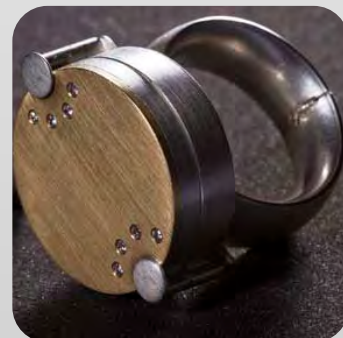


**2** But not all protective gases are the same!

**Argon 4.6:** In numerous tests, this gas has delivered the best welding results when used with the PUK. The term "argon 4.6" stands for argon gas with 99,996 % purity.

Other protective gases that are readily available on the market are generally less suitable. Nitrogen for instance, causes porosity when working with gold alloys. Stainless steel reacts even more extremely, and actually inflates.

Those users, who work solely with silver, might consider using mixtures of argon which contain 5% to 30% helium. These combinations of gases have a high energy density and generate a larger diameter arc. They should not therefore be used near stones as these could be damaged.



## 14.2 Protective Gas



**3** For optimum welding results, it is also essential that the correct gas pressure is used.

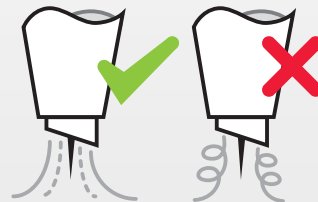
A flow rate of about **2 litres per minute** is ideal. This equals a pressure of about 0.4 bar.

Most of the pressure regulators, that are readily available on the market, are designed for use with much higher flow rates. For this reason we offer our own pressure regulator which has been specially modified to match the PUK (fig. 14.2.1).



(fig. 14.2.1)

If the flow rate is too high, the argon gas will start to swirl when it leaves the hand piece. This swirling will cause the argon to become mixed with the air around it and cancel out the positive effects of the protective gas (fig. 14.2.2).

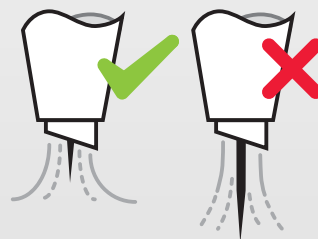


(fig. 14.2.2)

Lampert Company offers an improved hand-piece nozzle for all PUK models. The nozzle is designed to use even less gas (max. 2 litre per minute), and at the same time provides best welding results.



(fig. 14.2.3)



(fig. 14.2.3)



The models PUK 3 and PUK 3s cannot be operated without protective gas. If no protective gas is attached to the machine, the display will show an error message. (Please note that it is normal that this error message very briefly appears directly after the welding process is completed.)

**4** Just as important is how far the electrode tip sticks out of the hand piece.

The less the electrode sticks out of the hand piece (the "shorter" it is clamped into the hand piece), the better the protection by the argon gas will be. As a general rule, the electrode should not stick more than 4 - 5mm out of the nozzle.