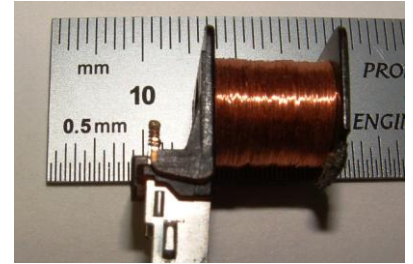


MICROPLASMA ARC WELDING DOES THE UNUSUAL

There has been much written about the advantages and disadvantages of plasma welding. Plasma Arc Welding (PAW) is usually compared to Gas Tungsten Arc Welding (GTAW). Below are a list of examples why plasma welding works in the real world.

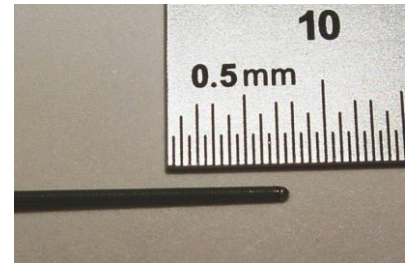
1. Brass Welding and Copper Tin Coated Wire Welding

One advantage of PAW over GTAW is the protected electrode. When welding materials such as brass or tin coated wires that have a high concentration of zinc, the brass material out gasses during welding. The out gassing of zinc would contaminate the tungsten electrode during GTAW welding and drastically shorten the life of tungsten electrode. Shortened electrode life decreases production time. With PAW, the electrode is protected by a nozzle. Tungsten electrode life is much longer and production is higher. Plasma welding is used in welding brass truck radiators and tinned plated electrical connections.



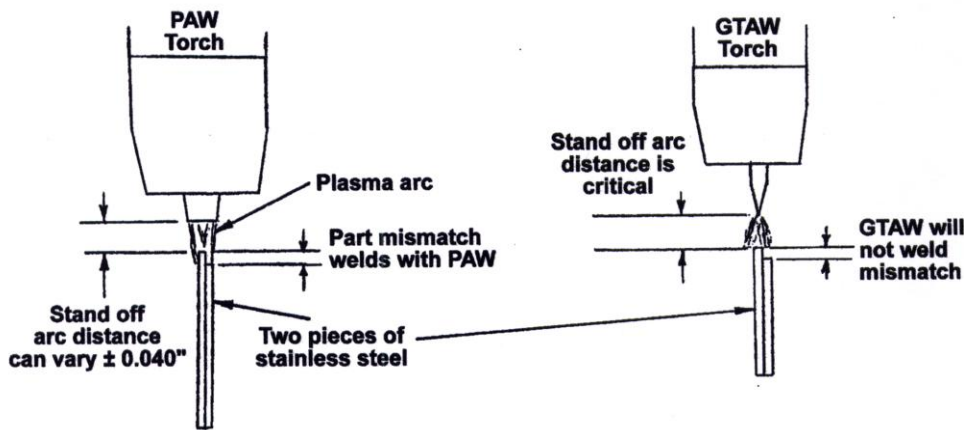
2. Teflon Coated Medical Guide Wire Welding.

Another advantage of PAW over GTAW is pulsing. There are PAW power supplies on the market that can pulse up to 10,000Hz. Pulsing when welding teflon coated medical guide wires can be used to have the arc stay on a high amperage for 10% of the pulse time and 90% on the low pulse time. The high pulse burns the teflon and cleans the wire and the low pulse does the welding of the wires. Pulsing in the case of brass welding produces welds that are cleaner and they have less porosity. Also pulsing stiffens the arc and enhances the column shape of the arc.



3. Thermos Bottles Made of Stainless Steel.

PAW stand off arc distance is not critical like GTAW. The stand off arc distance can vary from 0.040" to 0.060" and the PAW will still produce good welds. A good example is butt fusion edge welds of stainless steel. A well known customer that manufactures stainless steel thermos bottles was having problems welding the bottles with GTAW because of runout and mismatch of the parts. See drawing below.



Stand off arc distance is the distance from the weld nozzle to the work. In GTAW welding the stand off arc distance must be very consistent. If the distance is not consistent the voltage to the welding torch changes and there is then a drastic change in heat input to the part (either higher or lower). PAW is very forgiving of part variation. Also when edges are mismatched the PAW equipment will still weld. A GTAW arc will want to jump either to one edge or the other. A PAW arc goes where you aim it. You can also have tooling and chill damping closer to die weld joint and the PAW arc will go where it is aimed. The GTAW arc will go usually to the tooling. Another application where PAW is used is the welding of medical guide wires with a Teflon coating.

4. Welding of Fine Wire Mesh.

Low amperage arc welding and non transferred arc welding PAW can be used to weld very fine wire mesh used in the fiber and paper industries. An arc can be started at 0.05 amps. In GTAW welding the arc start, because of a high frequency burst will destroy many small parts. Also the plasma can be modified to weld using a non transferred arc which is a arc established inside the plasma torch. This technique is used when an arc of 0.05 amps would be so high it would destroy the material. Because plasma arc welding does not have the high frequency arc burst it can be used easily used with robots and automated equipment.

