



The convenience of welding in the laboratory

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It is no longer possible to think of a modern dental laboratory without equipment for welding. Initially this technology was successfully introduced in dentistry by the well-known and trusted lasers, machines which offer obvious advantages.

Not only the welding makes use of the same working materials (Fig. 1), rather than using a welding wire, as in the classical procedure ensures excellent biocompatibility, and is also much faster. Why? First of all, one does not need to create a model. In case repairs are needed it is not necessary to disassemble the model, since if one treats the work correctly one can weld safely even in the immediate vicinity of the resin saddles (Fig. 2) or of the ceramic coatings (Fig. 3) without damaging the work. Moreover, the welding points, if well executed, have at least the same stability of the original alloy. The minimum stability value in welding of 350 MPa required by the DIN's norms is widely exceeded.

So why do not we find then a laser welding device in every dental laboratory? For many laboratory owners it has not been and it is not easy to face the initial investment and the fixed costs. To lift many

from this burdensome choice, back in 2003, primotec / Bad Homburg presented the first generation of phaser welders. Phasers are welding devices that work on pulsed micro arc technology. Differently from lasers, which emit energy for welding through beams of light (laser), the phaser works with current. This current emits a micro arc, which acts as impulse on the point to be welded (Fig. 4) for a time ranging from 3 to 40 milliseconds (depending on the program setup). The substantial difference between the two types of device therefore, lies in the fact that in order to convey energy on the welding point, thus on the work, the laser works with light, while the phaser with current. From the point of view of the alloy, the fact that the melting point is achieved through the action of light or current does not make any difference.

Thanks to this philosophy of using electric current instead of



Figure 1 — Increased biocompatibility - the creation of a point of contact, inadvertently abraded, with the same material



Figure 2 — Area of heat influence reduced - repair of a bridge with clasps without the need to disassemble the resin saddles



Figure 3 — It takes a bit of exercise, but it is not too difficult to weld right next to the ceramic coating

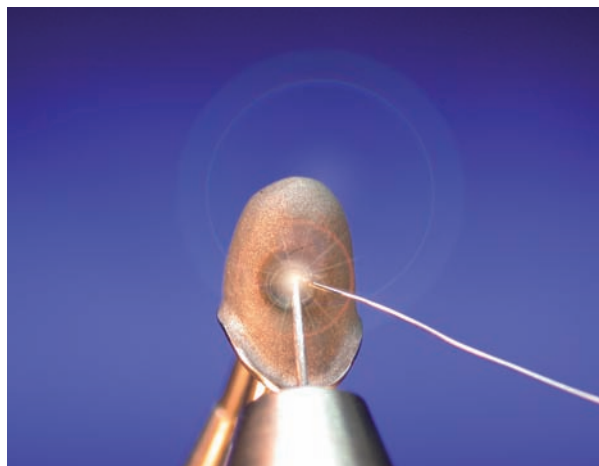


Figure 4 — Generally a bit of filler material and a pulsed micro arc are sufficient to close a hole in a crown

light, clearly much less expensive than the laser technology, the primotec phaser has become the best selling micro-impulse unit in the dental technical world. In addition, there are some solid economic reasons which can be attributed to its success: we begin with the initial expenditure which is very reasonable; continuing with the minimal usage costs (only Argon and tungsten electrodes) up to the fact that phasers are devices that do not require maintenance, and are very compact and are not noisy because they have no fans and no pumps.

Of course, even in the face of the many economic benefits one must first of all assess the simplicity of use and the optimum results. Still, welding with micro pulse phasers has so much to offer that, after an "aesthetic touch-up" and the increase of the family products in 2005/2006, we have now reached the third generation with two models of appliances (Figs. 5 and 6). The latest developments in electronics and technology have given rise to an entirely new platform, thanks to which the welding technique with the phaser has been further improved. This new platform allows one to customize almost at will the micro arc that produces the welding point, and to dispense it out with even greater precision (Fig. 7).

In addition, the operations have been further simplified. The

device is designed in such a way that even an inexperienced user has to only select a program based on the type of alloy that he wants welded, the energy level suitable for the work (micro, thin, normal, thick) and immediately begin to weld with all safety (Fig. 8).

The preinstalled programs are:

- alloys with a high gold content
- low gold content alloys
- silver-palladium alloys
- palladium alloys
- hybrid welding (e.g. gold on steel)
- chrome-cobalt
- nickel-chromium
- titanium
- contact welding
- pin welding

In the flagship model phaser as2, there are also two preset programs for orthodontics (Fig. 9). Of course, there are lots of possibilities to define the settings that can be used by the more



Figure 5 — The brilliant design of the as2 class luxury phaser, where form follows function



Figure 6 — The excellent ergonomics of the mx2 upper class phaser, even in the most restricted spaces



Figure 7 — The welding in micro spaces have been optimized; correction of the edges with the help of a thick wire 0.35 mm



Figure 8 — Very simple and logical, thanks to the large button to press and rotate that offers exceptional ease of use

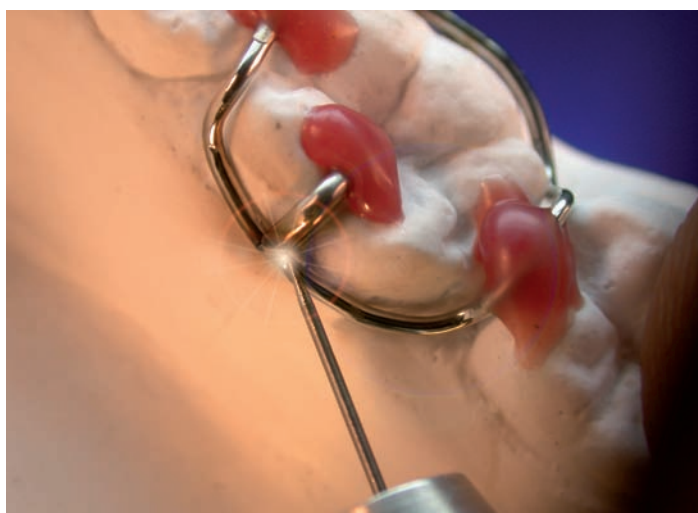


Figure 9 — Feeling "at home" even in orthodontics. The optimization of the welding in micro areas together with the contact welding provides the best results

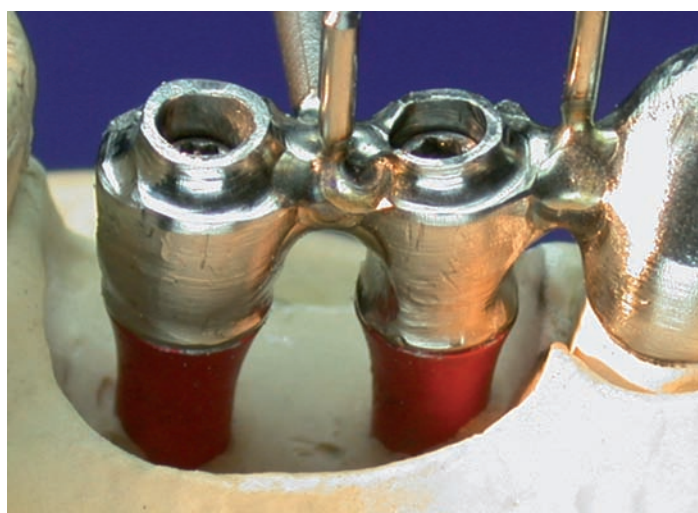
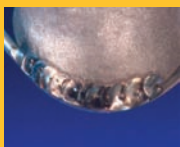


Figure 10 — With the phaser devices one can perfectly weld work even on more complex systems

LASER QUALITY WELDING AT A FRACTION OF THE COST



repair of broken clasp



margin extension



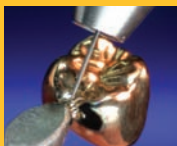
hole in crown



contact point



orthodontics



hybrid welding



cast bridge element to Captek or electroformed coping



bridge



secondary crown to partial



attachment to partial



partial extension



implant cases



repair of broken sublingual bar

phaser



The only dental welders with:

- **pulse shaping technology**
for even stronger and cleaner welds
- **high frequency pulse overlapping**
for even smoother and denser welds
- **40 presets** = 10 preset programs for all dental alloy types including Palladium plus four preset energy levels for each alloy program
- **four different welding modes** =
pulse arc – micro arc – contact – pin
- **three different ignition modes** =
soft – normal – deep
- **easy operation** –
just one main menu



phaser mx2



phaser as2

Save time and increase profits

One of the great advantages of phaser welding over soldering is the very small heat affected zone which allows welding right next to porcelain or acrylic.



cut



weld



finished workpiece



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Figure 11 — With the phaser work times are significantly reduced, for example in the case of expansion of partials or repairs



Figure 12 — Secondary crown on partial denture, an easy "welding exercise"



Figure 13 — Learning directly at their workplace; Rotating screen with video monitor



Figure 14 — In the phaser as2 brief tutorials on how to use the welder are included

advanced users to perfect their weldings.

But already with the above-mentioned basic settings one can obtain good results.

The limits of use can be further expanded. Besides being used securely for welding work on implants (Fig. 10), extensions of partials, repairs (Fig. 11) or combination work (Fig. 12), with contact welding, pin welding and micro-welding, the panorama is enriched with new modes that make the phaser welders even more versatile.

The phaser as2 has another peculiarity: its screen can be rotated (Fig.13). On one side there is the panel command itself, on the other side we find a TFT monitor in which there are loaded brief tutorials regarding the use of the device (Fig.14). Thanks to these, the user, expert or not, can discover all the "tricks of the trade" just when one needs it.

With the new pulsed micro arc phaser a generation of devices has born, and thanks to them the user can tackle in the laboratory every day welding work with more versatility, more security and more convenience. ■