

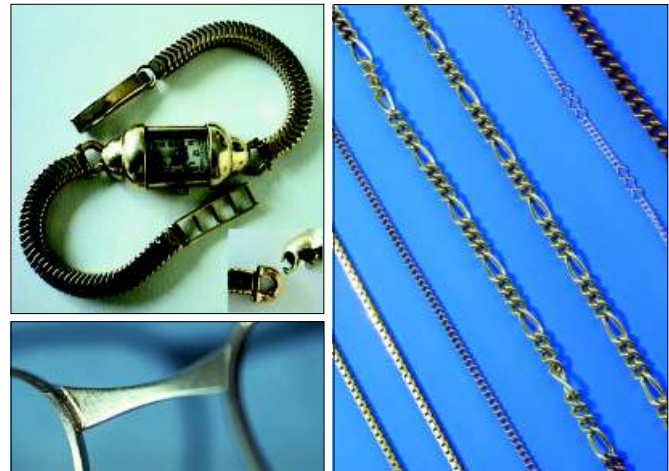
Laser Welding in the Jewelry Industry

**“StarWeld
Jewelry Welders
turn you from a
Jeweler to a
Professional
Jeweler”**

Restoration and repair of vintage Edwardian, Victorian, Etruscan, Revival, and Granulation jewelry; in fact, any job that never would have been attempted in the past for fear of gem sensitivity or the number of hours spent in preparation. These are among the strengths of the StarWeld Microwelder.

And, according to a renowned European jeweler at an industry conference, "One of the most important jewelry applications for the StarWeld is the ability to repair/fill voids created during the casting process, thereby retaining its full value".

Normally, pieces with these voids are either scrapped, or, if repaired using conventional methods which leave telltale marks noticeable to the trained eye, lose their value. Typically such pieces are intricate gold or platinum that begin from a basic casting (e.g., gold ring) to which



(1) Repair of vintage Rose Gold Rolex wristwatch accomplished easily using the StarWeld Performance Microwelder. (2) Seam weld repair of titanium eyeglasses. (3) High-quality gold and silver chains, fabricated or repaired using the StarWeld 20 fiber-optic

further decorative work is added and, finally, stones. Only when the piece is fully assembled is it sent for polishing, during which process defects in the casting will show up.

Repair Cracks and Voids Invisibly

The challenge now is to repair these voids and cracks invisibly, if possible. Using conventional brazing methods, the stones would need to be removed, and an alloy of the host (ring) material with a lower melting point used to fill the defects. This has a number of disadvantages:

- Labor cost to remove/fit the stones

- The alloy filler used is softer than the host material and still tends to polish away during repolishing, resulting in shallow indentations which lower the value of the piece

- The alloy material has a different color than the host.

The laser offers the following advantages when making these repairs:

- Because of localized heating, there is now no need to remove precious stones (even welding in the close proximity of rubies, which are most sensitive to heat, is possible with the laser).
- Because of the intense concentrated heat of the laser, the same filler material as the host can be

Watch case and band being examined for spot welding



The StarWeld Performance Laser Microwelder specifically designed for spot or seam welding of different metals or metal combinations. The StarWeld 20 Chain Welder; special purpose welding of gold, silver, platinum, or other metal using a unique "Plug and Play" Fiber-Optic Beam Delivery System.



smoother finish when used to fill imperfections in the casting. In fact, the idea for the variable focus came from Baasel Lasertech's jewelry representative in Germany!

A dedicated, low-cost Chain Welder

The making of jewelry chains is nothing new to mankind. The first ones were made of stones, shells and bones. The oldest gold chains were made in 150 BC in Ebla, a Greek settlement in North Africa.

Until the first decades of the 20th century, most of the jewelry chains were handmade. Then machining became popular. To achieve higher quality in strength and shape, soldering was the production method of choice.

Even today, most chains are still made in a production process of seven major steps. After forming a wire into a chain, the worker must:

1. Scour off grease
2. Rub with solder
3. Tallow by hand
4. Solder in an oven
5. Remove the tallow
6. Clean the chain
7. Polish the chain

Using solder always lowers the quality of the chain (not a big issue with inexpensive; i.e., <14 Karat, chains). Now, the trend toward chains of

higher purity and quality (14, 18 Kt) demands joining technologies that ensure constant purity. That trend also increases pressure to reduce production costs.

This is where the laser becomes the tool of choice; a tool that reduces production steps to just three:

1. Scouring off grease
2. Cleaning the chain
3. Polishing the chain

thus reducing costs up to 40%.

Today, the artisan or manufacturer has a choice of laser welders specifically designed for the jewelry industry.

Chain Welders (such as the StarWeld 20), with specialized features such as programmed pulse sequences for working on the most popular jewelry chain types and pulse shaping, are among the jewelry-specific systems available.

Also available today are manually-operated spot/seam welders (the StarWeld Performance from Rofin-Baasel) with 15X microscopes (for absolutely precise positioning of the weld) enable jewelry manufacturers, store owners, and repair shops to weld, or solder different metals and metal combinations. Jobs that never would have been attempted in the past for fear of gem sensitivity of the number of hours spent in preparation are easily accomplished using these welders.

used, resulting in repairs that are practically invisible, thereby retaining full value of the piece.

Spot Welding in the Assembly Process

Another application for which the system is also being used is spot welding earring shells prior to sending them through the reflow oven.

Traditionally, the two halves (shells) which have solder

paste placed between them are held together with stainless steel wire, a time consuming task to fit and one which adds additional cost. Placing a few spot welds around the perimeter of the piece holds it together and speeds up the assembly process.

The variable focus adjustment feature is absolutely essential for jewelry applications. The small spot size is used for joining parts to the piece to be worked, while the larger spot size gives a