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The Technology In Laser Welding

What is laser welding? Simply stated, laser welding is the ability to weld metals, using amplified light as the source, to produce a solid weld. It sounds complicated, but is really quite simple. Laser welding actually uses a specific wavelength of light to accomplish the welding process. This light is concentrated, adjusted, and controlled by jeweler operators, in much the same way as they would control and adjust the flame of a soldering torch. However, compared to soldering, laser welding is faster, cleaner, and more cost-effective for many manufacturing and repair applications.

What metals can be welded with the laser? All of the traditional jewelry metals can be laser welded—all base metals, karat gold, sterling silver, titanium, palladium and platinum. Platinum, historically one of the most difficult metals to work with and repair, is one of the easiest metals on which to perform laser weld repairs! Welding different metal groups is also possible, i.e. gold to platinum, sterling to gold, etc.

How difficult is it to operate a laser welding machine? Our laser welders are extremely user-friendly. There is a short learning curve, so that any entry-level jewelry personnel can be quickly and easily trained to perform basic welding applications. While there is no substitute for an experienced bench jeweler, many repairs, which could have only been handled by a jeweler, can now be taken care of by utilizing more of your shop staff. Experienced jewelers, who have these laser welders, generally find that it takes between 10–20 hours of hands-on practice using the laser welder to become proficient for all their standard applications.

With this basic understanding of what laser welding is, what metals can be welded, and the fact that it doesn't take a degree in quantum physics to be able to operate, the big questions are: "How does this technology apply to my manufacturing or repair operation?" and "How do I make money with this capital equipment?"

The answers will save you time . . . and time is money!

In the manufacturing environment

Casting

The major problem, typical for any casting or manufacturing operation is porosity. This single problem has created countless nightmares for the manufacturing jeweler. Millions of dollars have been spend on hi-tech casting machines to correct this problem . . . and the problem still exists in some cast metals. Laser welding corrects porosity in casting quickly! Whether the porosity is discovered in the raw casting or in a finished, polished, stone-set piece of jewelry: almost all porosity can be corrected and repaired with the addition of metal to the porous area without removing stones which have already been set. The time and money involved in removing set stones is eliminated. The repair is quick and easy. The time and expense to recast is no longer an issue, because there is no recast to do. Think of the time savings, productivity increases and money savings by these application examples alone represent.

Assembly

Laser welding is easily adaptable to many assembly operations, such as bracelet pinning. Since there is no solder involved, there can be a substantial savings in eliminating the cost of expensive solder. Also, there is no "halo" effect on the metal, which would be visible when using a differing karat solder and this even happens when the same karat solder is used.

Many traditional assembly methods require wiring or stringing techniques to hold pieces in place prior to soldering. With laser welding, these pieces are now tacked together very quickly, eliminating the time involved in these traditional methods.

The manufacturing environment affords many uses for the laser welding machine. Companies that currently have laser welders in their facilities are discovering applications and techniques far beyond the basic welding applications described.

The ultimate goal for incorporating laser welders in the manufacturing process is to produce a product, which provides your customer (retailer or wholesaler) with a high-quality and near-perfect piece of jewelry.

In the Retail-Repair Environment

Antique Repairs

Antique pieces, typically require many hours of preparation and set-up to remove stones and heat sensitive materials before a repair can even be attempted. With laser welding, the heat-zone is very small and most applications such as sizing and filigree repair can be accomplished without removing heat-sensitive stones (i.e. opals, emeralds and pearls). The elimination of set-up time, as well as the elimination of the time to reassemble such intricate pieces, makes it possible to process and complete these repairs in a fraction of the time needed for traditional torch methods.

Repairs to Spring Mechanisms

Again, the heat zone is so small and the beam so precise that the laser beam will not affect the spring mechanism. This makes it possible to weld euro-wires, lobster claws and spring rings, and opens up income-generating possibilities for watch repairs.

More...

Eyeglass Repairs

With the laser welder, eyeglass repairs are now made quickly and easily—even repairs to exotic metals such as titanium. The ability to advertise and provide eyeglass repairs can open a brand new income stream to most jewelers.

Typical Repairs

Repairing chains can be made by store personnel, with a small amount of training. This leaves the highly-skilled bench jeweler to handle the more difficult jobs.

The goal of any repair shop is to take a damaged product and correct it in order for the consumer to be able to wear and enjoy the product again.

Within the jewelry industry, the use of laser welding machine is gaining universal acceptance. Laser welding machines are currently being used in one-man repair shops, retail repair stores and large manufacturers. The benefits and savings of increased production, elimination of expensive solders, quicker turnaround, and time all add up to increased revenues!

Each repair shop or manufacturer may have specific problems and applications, which have not been mentioned here. With this basic overview and introduction to laser welding, some of the benefits of this new technology have been high-lighted, we invite you to contact us for any specific requests or questions you may have; we welcome all inquires.