Welding innovators Guild International offer customized excellence

Guild International is an innovative manufacturer of welding technology which is exported and used around the globe. Specialized in providing customized welding solutions, the company offers the widest possible range of welding technology and continues to be at the forefront of welding technology developments. Stainless Steel World spoke to company President Mike Wheeler and Sales Engineer Mark Wagner about how Guild continues to serve the global market with high quality welding machines, and their innovative move into fiber laser welding technology.

By Joanne McIntyre

Stainless steel applications have become increasingly important to Guild International over the years, and today almost half the machines the company produces are utilized for the welding of corrosion resistant alloys (CRA). "In the past 10-15 years we've seen a dramatic increasing in demand for CRA lines, and today almost 50% of the welding machines we make are destined for stainless steels," explains Mr. Wagner. "For instance we have supplied 38 machines for welding stainless steels in China since 2000. These are used on a variety of lines including bright anneal lines, tension level lines, grinding lines, hot rolled annealed and pickling lines and coil build up lines for making coils that run through the rolling mills."

Resistance welding: faster and thinner

Guild International supplies a large number of arc and resistance welders to markets around the globe. "Resistance welders are particularly ideal for achieving a fast weld on thin strips and offer several advantages over TIG welders," explains Mr. Wheeler, who goes on to explain the differences between these two techniques.
"Typically TIG welding is suitable for material thickness from 0.25 mm up to 6.0 mm. With TIG welding the two coil ends are clamped, sheared, and then precisely butted together so the two ends are touching very tightly. A TIG tungsten arc torch is drawn across the seam where the strip ends are heated and flow together, creating the weld. By contrast, with resistance welders the two coil ends are overlapped. For machines used in the smaller lines, grinding lines etc. the overlap is about 16 mm. After the ends are clamped a rotary electrode rolls across the strip to make the weld. This results in a weld that is approximately two times the parent metal thickness."
"On the more sophisticated resistance welding machines we make a very small overlap of around 0.5 – 1.0 mm

Guild International's NB Overlap Spot Resistance Welder installed for POSCO on a grind & polish line in their stainless steel processing plant in Turkey. The NB Overlap Resistance Welder can be used on most materials ranging from about 0.075mm (0.003") up to about 6.5mm (0.250") thick and on any width up to about 2,500mm (100").

Mike Wheeler: "We are open to new ideas and pride ourselves on being flexible."

Mark Wagner: "Our staff of engineers can tackle any challenge."

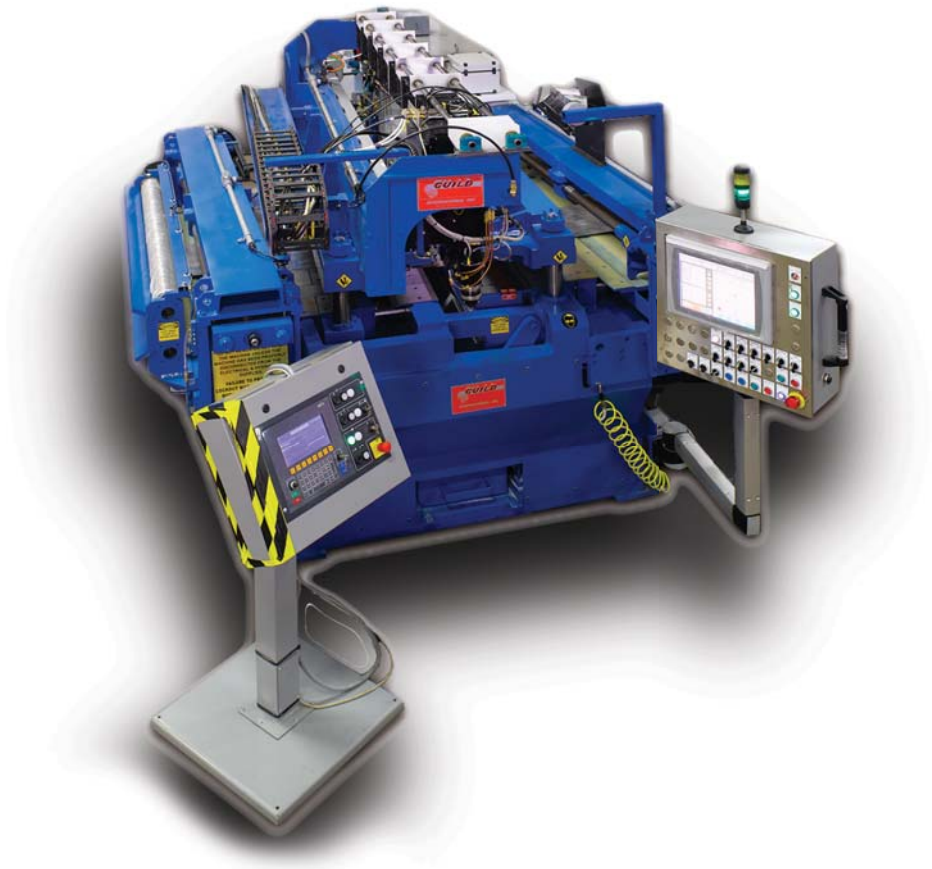
The QM Series of resistance Seamwelders produce very high quality welds that are generally no more than 10% thicker than the parent material.

depending on the gauge. The weld takes place directly behind the rotary electrodes which generate the heat. Two rollers then compress the soft weld down to just 10% more than the original parent-metal thickness. Resistance welding achieves a very fast weld made on very thin strip; for example a complete weld cycle on strip measuring 1-1.5 mm wide and ½-1 mm in thickness can be achieved within 45 seconds from line start to line stop, depending on the material to be welded."

NB Overlap Resistance Welders produce a fast, high strength weld.

Fiber laser welding innovation

The expertise and experience that the Guild team has built up over the years is essential for success in the global market, explains Mr. Wheeler. "Typically the more exotic materials are getting thinner and stronger so we've evolved our machines to adapt. For instance we've inserted in-line induction annealers, and adjust our technology to produce fast, high quality welds. In this industry you can't take years to develop machines; we have to make sure our technology is evolving as fast as the



The MEL laser welder is derived from a fully solid state laser which has no moving parts and requires no special high price optics.

market. Material has to pass through the process with no issues. The customer expects zero welding defects and it's 100% our responsibility to make sure we know what we are doing."

Guild now adds induction annealing equipment to its laser, resistance welding and arc welding machines. This is basically a ten inch long inductor that follows the torch or the welding wheels on the resistance welders, re-heating the material as the welding takes place. It anneals the strip and this increases the strength of the weld, particularly with exotic materials or very high strength, automotive grades of steel.

An exciting innovation which the company is now working on developing is fiber laser welding. "Guild has produced several types of CO_2 laser welders over the years; however CO_2 laser technology is prone to optical and alignment issues. While there are ways to address these issues we have decided that the future lies with fiber laser technology which delivers the beam through a fiber optic cable. Also, fiber laser is solid state fiber derived. This technology uses no mirrors so there are no alignment issues. Our LHMA Laser Welder utilizes a fiber-built laser to deliver the necessary energy for welding via a fiber optic cable connected to a focusing head. The focusing head concentrates the energy to a very fine spot to achieve weld results never before possible on steel, stainless steel, cooper and brass alloys and aluminum. While laser welders are more expensive than arc welders they offer a better quality, thinner weld compared to a MIG welding machine."

Guild international is one of only a couple of companies in the world developing fiber laser technology. "Fiber laser welding is definitely the way of the future."

The LHMA laser welder can create complete edge-to-edge welds without the need for start and stop tabs, on strip as thin as 0.08mm.

Trends in the stainless market

Guild typically exports around 90% of its welding machines with Asia being the most important market. "The countries in which we've seen the most growth are China, India, Taiwan, Turkey, Korea, Vietnam, and the United Arab Emirates," says Mr. Wagner.

"The stainless steel market has certainly experienced a significant slow-down in recent years. We're not seeing as many projects and our customers seem to have an over-capacity in the austenitic sector. By contrast the ferritic market seems to be expanding, especially in China. The Chinese austenitic sector is mature and we are now seeing our larger customers moving into the less saturated markets for high-end and difficult to manufacture grades of ferritic steels and high quality alloys. The large mills have the resources, technology and people to do this and they know that that's where they can make more money."

The history of Guild International

Guild International was founded in 1958, supplying welding machines to the fledgling tube and pipe mill industry. The company produced increasingly wider dimension welders for pipe processing lines. Throughout the 1960s as the company grew so did the size of the welding machines it produced. Even in those formative years Guild was focused on the export market, with licensees set up around the globe. While most of early welders were used on carbon steel lines, within a few years Guild was producing welders for non-ferrous metals, copper, brass, aluminum, stainless steel, and more recently exotic materials such as duplex.

"Our roots go back to the development of the global tube and pipe industry, after which we subsequently expanded into larger welders for steel mills," explains Mr. Wheeler. "The first machines we produced were arc welders; the processes used were TIG, Metal Inert Gas (MIG), Metal Active Gas (MAG) and plasma welding. During the 1980s as the markets we serve evolved we also began producing resistance welders, and today fiber laser welders are our latest innovation."

The RCM Zipwelder is a fully automatic welding machine engineered to be the most technically advanced shearwelder available.

The Chinese market has made up a significant proportion of Guild's business for the past 15 years. It has supplied the country with a large number of welder machines for aluminum, carbon steel and silicon steel, in addition to machines for non-ferrous materials.

Guild began producing welding machines for duplex stainless steels almost ten years ago. "At that time duplex was a new material for us, so we enlisted the help of our friends at the Edison Welding Institute. We have been associated with the Institute for many years. Headquartered in Columbus Ohio, they have several hundred welding engineers and whenever we come across materials that we haven't worked with before we partner with them to establish the correct parameters."

Demand for duplex welding machines in the United States still lags behind other regions in the world, explains Mr. Wheeler. "Most of the duplex projects we see are in Asia; the stainless steel market in the US is very mature and we don't see any significant move into the use or manufacture of duplex."

"A notable trend in recent years is that our customers are now adding rolling mills into the lines to reduce subsequent coil handling and re-rolling. Lines are becoming more complex, and with the addition rolling mills in the line the welds are subjected to greater tensions, so they need to be higher quality to withstand the rolling forces."

Global after sales service

With around 90% of its machines being exported around the globe, Guild International has a well-established network of service engineers ready to offer assistance at short notice. "Many of our machines go to Asia and particularly to China, so we have had a service team resident in China since 2000," explains Mr. Wheeler. "We also shuttle service engineers into a country when needed. We know it's important to provide on the spot service so we have a group of service engineers ready to rapidly deploy into Asia, Europe, South America, Russia or wherever they may be needed."

Widest range of customized solutions

One of the key factors that make Guild International stand out from its competitors is that it offers the full range of arc welding, resistance and laser welding machines. "This is quite unique," explains Mr. Wagner. "We literally produce the full spectrum of welding technology, in an enormous range of sizes and models. Our machines can weld material as thin as 0.08 mm and as thick as 25 mm. We can welded as on strip as narrow as 3 mm and as wide as 3 meters. I literally don't know any other company that produces any like the range of welders that we do."

With such a wide variety of models in house the company can provide highly customized solutions. "We have an in depth understanding of the industries our customers are involved in and know the requirements of their jobs, because we have machines used in every steel sector. From the non-ferrous industry processing of tube and pipe and very thin products…we can do it all, which is very rare."

While Guild produces an enormous array of welding solutions it also has the expertise to offer customer-built solutions. "Our staff of engineers can tackle any challenge we're faced with."

"For example we had a customer who wanted to shear and weld on a 45 degree angle, producing an x-ray quality weld. Typically welds are either made straight across or on a slight 2-3 degree angle, but our team was able to come up with a solution to achieve what the customer wanted. As long as we feel that an idea is workable we will take it on. Requests range from weld inspection equipment to milling and grinding of the weld; these are all options we can offer. When a customer wants to use certain components we will accommodate that, provided we feel confident they will work on the machine. We are open to new ideas and pride ourselves on being flexible."

Facts & Figures

Name:	Guild International
Headquarters:	Bedford, Ohio, USA
Main products:	Laser welders, arc welders, resistance welders, tube mill entry machines
Turnover:	USD 10,000,000 – USD 20,000,000
Employees:	30-40
Website:	www.guildint.com