Guild International: a world supplier of superior coil joining equipment

Guild International is not new to the world of designing and manufacturing coil joining and strip accumulating machinery. Based in Bedford, Ohio, USA, they have maintained the status of being one of the world leaders for supplying welding machines to weld strip steel coil ends together since being established in 1958. Valued by their customers for being able to continually increase their productivity and yield on thousands of installations, and on virtually all types of coil processing lines and materials around the world, Stainless Steel World recently talked to Mike Wheeler, President and Owner of Guild International and Lee Kothera, Vice-President of Sales about the company's success story, products and latest technologies, and visions for the future.

By John Butterfield

Brief history

Many of Guild International's early machines were used to weld carbon steel coil ends together in tube and pipe mills, on roll formers, and on stamping lines. However, as stainless steels became more and more widely used over the years, and the demand for welding these coil ends together arose, Guild modified their machines to handle the higher shearing and clamping forces required for these metals. They developed the proper welding processes for joining the stainless steels and the various stainless alloys together. Numerous early welders were built for new stainless steel process lines in Japan and the USA during the 1960's. At this time, new stainless and nickel alloys were being introduced to the industry and Guild International supplied many welders using Plasma or Sub Arc or MIG welding to join coil ends together on coil build-up lines. Many of the welds completed on these lines were made on a slight angle, or bias,

which allow for subsequent rolling of the weld through the rolling mill. By making the weld on a bias, only a small section of the weld passes through the rolling mill work rolls at once, thereby reducing the shock caused by slight weld over thickness. Typically coils from 1.5–10 mm are welded together, then the weld is either edge-trimmed or the start and stop points of the weld are notched to remove the stress risers at the start and stop points of the weld. With these stress risers removed, the weld is much stronger and passes through the rolling mills without difficulty. The strip and welds are reduced in thickness by more than tenfold when passing through the rolling mills.

Over the years, Guild has supplied stainless steel welders for use on Coil Build-up Lines (CBL), Hot-rolled Annealing and Pickling Lines (HAPL), Coil Grinding Lines (CGL), Cold-rolled Annealing and Pickling Lines (CAPL), Tension Level Lines (TLL), Bright Anneal Lines (BAL), and anneal and pickle lines, which also include a rolling mill, called a DRAPL (Direct Rolling Anneal Pickle Line), or WRAP (White Rolled Anneal Pickle). The strip widths on these lines typically range from 1300–1650 mm wide.

Looking at products

Generally, the resistance welders are used on clean strip without scale and usually on a thickness range from 0.2–3.0 mm thick. These resistance welders make a weld on overlapped coil ends. The more expensive welders have a shear and they accurately position the sheared ends, with a very small overlap, to the weld and planish wheels. The resultant weld is just slightly over parent metal thickness. The lower cost resistance welders produce an overlapped weld joint of about 16 mm, and the copper weld wheel travels over the strip creating heat and thereby joining the two coil ends together, with a double parent metal thickness at the weld area.

The MIG, Plasma, Sub Arc, and Laser weld is used for the thicker strips where there may be scale. The MIG Overlap weld can be used for overlap welding on strip from 0.3–1.0 mm thicknesses and MIG Butt welding can be used for strip from 1.0–16 mm thicknesses.

The welders used on the coil build-up lines (CBL) typically include MIG and or Plasma welding and strip notchers. Sometimes milling machines are supplied to mill the top and or bottom of the MIG weld flat so, as the weld is recoiled, it does not mark the subsequent wraps on the recoiler. Typical coil build-up lines are for strip 1.5–10 mm thick. Sometimes a carbon steel leader strip is welded to the ends of the coil to reduce scrap during the rolling process on a Z mill.

The welders supplied on Hot-rolled Annealing Pickle Lines (HAPL) are for strip ranging from 0.3–16 mm thick, but this range is not for one line. Some of the HAPLs are for strip from 0.3–6.0 mm thick. A thin gauge MIG welder with an automatic overlap feature for strip from 0.3-1.0 mm is provided for these lines. This way, the thin strip can be welded with a very small controlled overlap and the thicker strips, 1.0–6.0 mm are butt welded.

For the standard HAPL, for strip from 2–16 mm, a MIG butt weld is used. The coil ends are sheared and MIG Butt welded, typically with a small welding gap between the two strip edges.

The welders supplied on the White Rolling Annealing and Pickling Lines (WRAPL), make welds that pass through the rolling mill without any top or bottom milling of the weld. Reductions in thickness up to 50% are achieved with this type of line.

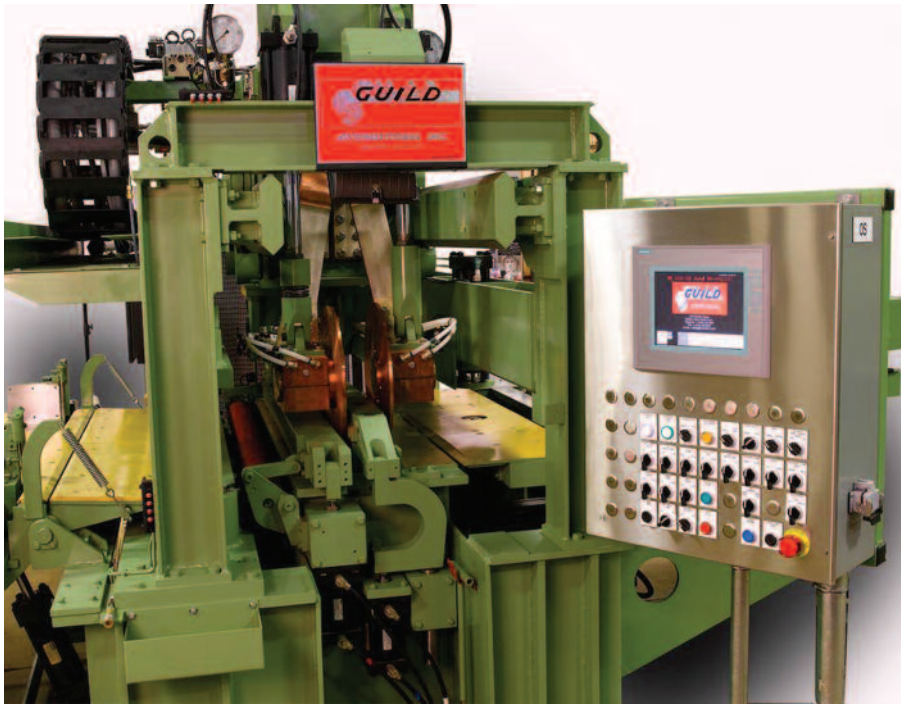
Grinding or Grind and Polish Lines (GL) typically cover a range of strip thicknesses from 0.2–7.0 mm thick. For these lines, an overlap resistance welder is typically used. For strips up to 1.6 mm thick, a continuous seam weld is used and for strip above this thickness, a rolling spot weld is used. The weld is twice the parent metal thickness, so the grinding heads in the line are opened as the weld is pulled through the line.

Cold Rolled Annealing Pickling Lines (CAPL) typically cover a thickness range of 0.2– 3.0 mm. A resistance seam welder with built-in squaring shear and automatic strip overlap is supplied. With

this machine, welding and roll planishing take place in one pass. For difficult materials, this machine can be supplied with an induction seam annealer to restore ductility to the weld, and this induction annealing step takes place during the welding and planishing, so no extra time is required.

Tension Level Lines (TLL) typically cover a thickness range of 0.2–3.0 mm. A resistance welder is used for these lines and either a machine with a built-in shear can be supplied, to provide for a flat planished weld, or a lower cost resistance welder which provides an approximate 16 mm overlap. With the larger overlap, the weld area is twice the parent metal thickness. Both machines make a strong fast weld.

The Bright Anneal Line (BAL) is typically for the thinner strips, 0.2–2.0 mm thick strip. These lines require a very fast, strong, flat weld, which is provided with the resistance welder with the squaring shear.

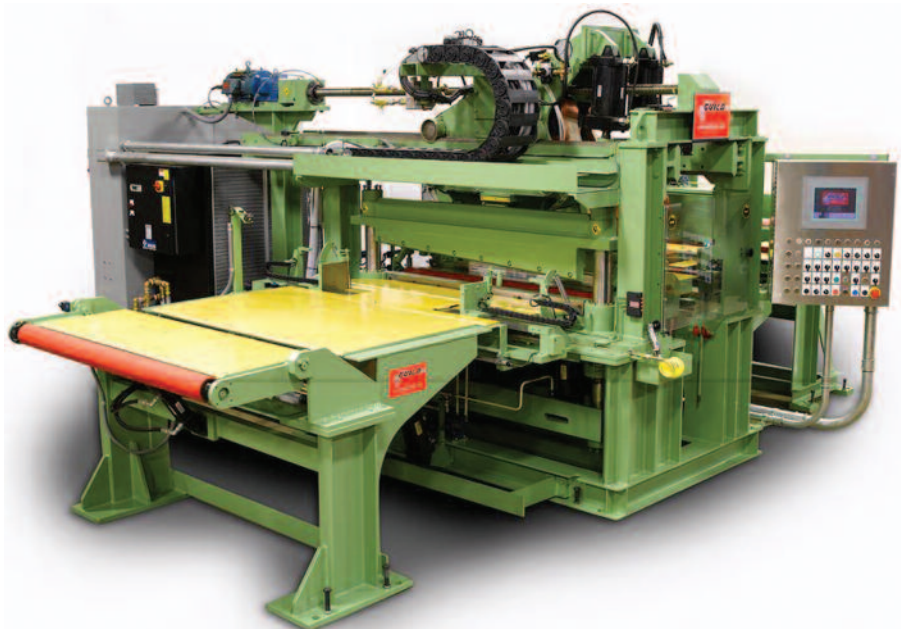


Welds created with the NB Overlap Resistance Welder are overlap welds created by the use of a weld wheel and a current wheel. Current passes from the wheel through the overlapped strip ends and a weld nugget is formed, joining the ends together.

Having the foremost clients

Since 1990, Guild has supplied over ninety welders for stainless and stainless alloys for the types of process lines mentioned above. These have been supplied largely to Europe, Asia, the USA, and Mexico.

An interesting, recent project was for Bao Steel Special Alloys. This consisted of sixteen process lines, of which, six required welders. The materials processed on these lines included, titanium, high-temperature alloys, corrosion resistant alloys, precision alloys, and chromium–nickel alloys. "The list of materials was extensive," says Mike Wheeler, President. "Guild was the only company in the world who made offers for all the welders and did so based on their knowledge of welding these materials and/or because they had contacts with welding engineers who did have experience welding these materials. The project was successfully commissioned, with all the welders supplied by us." "However, the project is not an exception for us," adds Lee Kothera, Vice-President of Sales "since we now have equipment in most of the major players in the US, China, Taiwan, South Korea, Europe, Turkey, Indonesia, and Vietnam. Generally, you could say that all major stainless steel producers have some of our equipment, and some work with Guild almost exclusively."

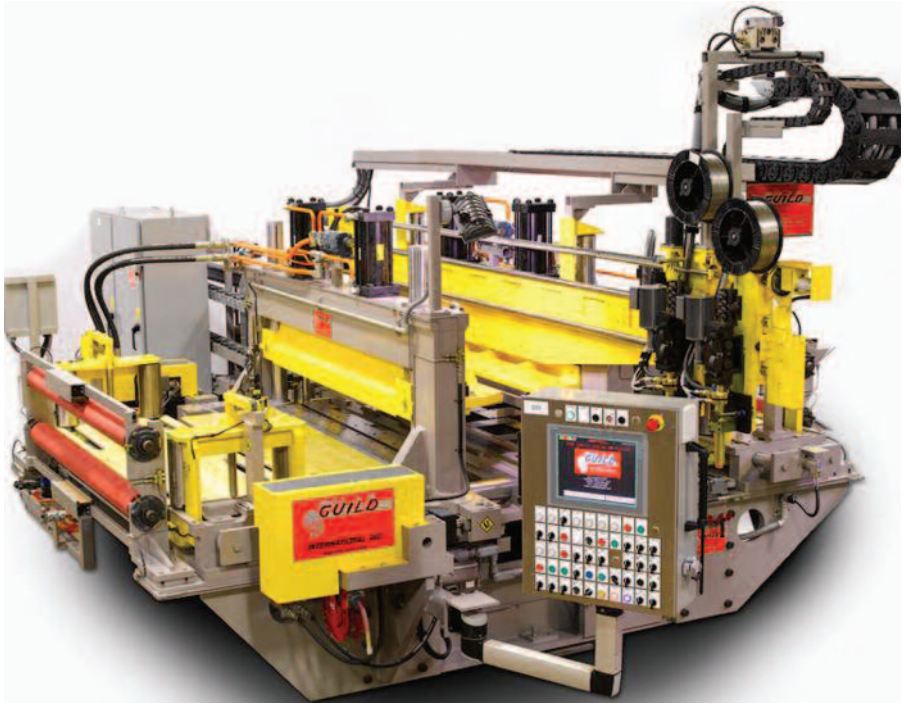


The NB Overlap Resistance Welder produces a fast, high strength weld. Units are available with shear and transfer clamps so that the overlap can be kept to a minimum.

Laser welding for the future

It appears that Guild International is fortunate in these economically uncertain times since they are able to report that business is very stable at present. For the future they look to laser welding as increasingly playing an important role in their business. Mike Wheeler takes up the story: "Whilst most people in the business seem to be supplying CO_2 lasers, we're moving in the opposite direction and are working with a hybrid MIG with a fiber laser. One of the beauties of this combination is that the beam is delivered with a fiber optic cable which allows retro-fitting to upgrade a machine to laser welding. That's a unique perspective." "Laser welding is also becoming more widely accepted and we anticipate that far more stainless lines will use laser welding

technology soon. This is due to the faster welding speed and the reduced heat-affected zone," says Lee Kothera. Guild International's laser butt welder uses the hybrid laser arc welding process known as HLAW. This advanced form of laser welding combines the high-power density process of a laser with the filler addition aspects of MIG welding. The result of this process is extremely fast weld speeds with minimal heat input. The MIG process also allows the weld metal to address mechanical properties of the weld metal and ensures there is no undercut in the weld joint. The hybrid process consists of a high-powered laser, optics (for transporting and focusing the laser beam), a weld power supply, a wire feeding system and torch, a chiller, and all the necessary safety equipment.



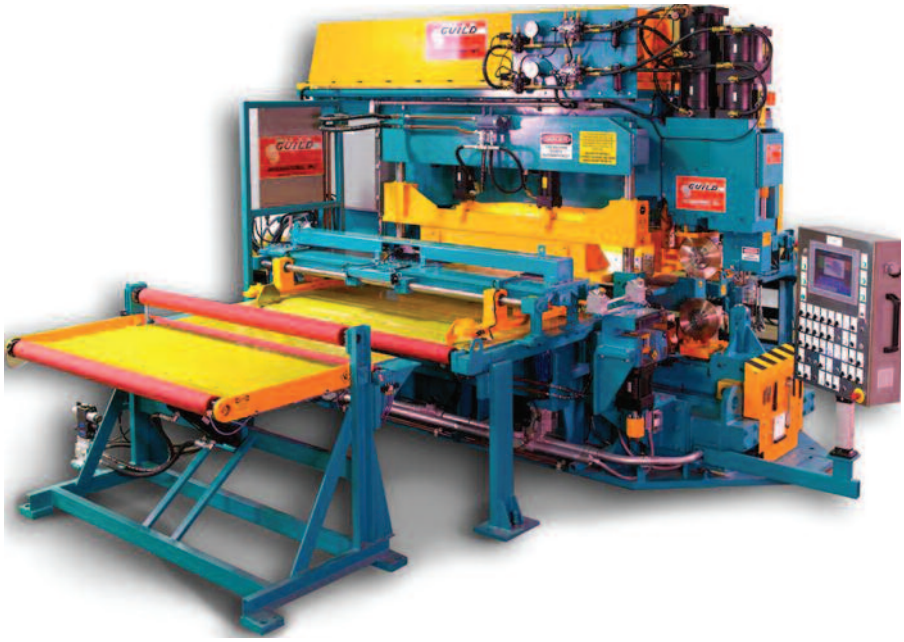
The RCM Zipwelder is engineered to be the most technically advanced shearwelder available. This fully automatic welding machine reduces operator involvement and increases mill uptime by reducing weld failure.

What makes Guild International special?

"When looking at the subject of what makes us special, I think that two things particularly spring out," says Mike Wheeler. "We are probably the only company in the world making all three products of arc welders, resistance welders, and laser welders. As such, we provide a sort of high grade one-stop shopping, particularly for our larger projects. This also makes the purchase of spare parts easier as well. Secondly, our service engineers are outstanding in providing not only support to our clients in setting up the machines and getting them in production but also in training operators and maintenance staff." "Moreover," relates Lee Kothera "should help ever be needed, we always respond very quickly and should it be needed we can normally be with them within twenty-four hours no matter where they are located in the world. There are never many issues with our equipment but we are always there for our customers."

A final word...

Mike Wheeler concludes: "There have never been more and better choices for joining the coils of stainless steel together. In this field we excel for our customers by not only providing them with the very best in high-quality equipment to meet their needs and improve their productivity and yield, but also to ensure, through the knowledge and advice of our team of engineers, that we determine exactly our customers' needs and ensure proper equipment design and compatibility with their existing equipment."



The QM Series Seamwelders produce very high quality welds that are generally no more than 10% thicker than the parent material. Welds can be made in less than 25 seconds using these welders, depending on strip size.

Coil End Welders for All Applications

Patented product line includes:
Zipwelders™
Resistance welders
Semi-automatic shearwelders and

Strip accumulators, including:
SupercoilsA®
Superloops™
Continuous coils