

Achieve Optimum Performance,  
Speed and Cost-effectiveness in  
Metal Assembly.

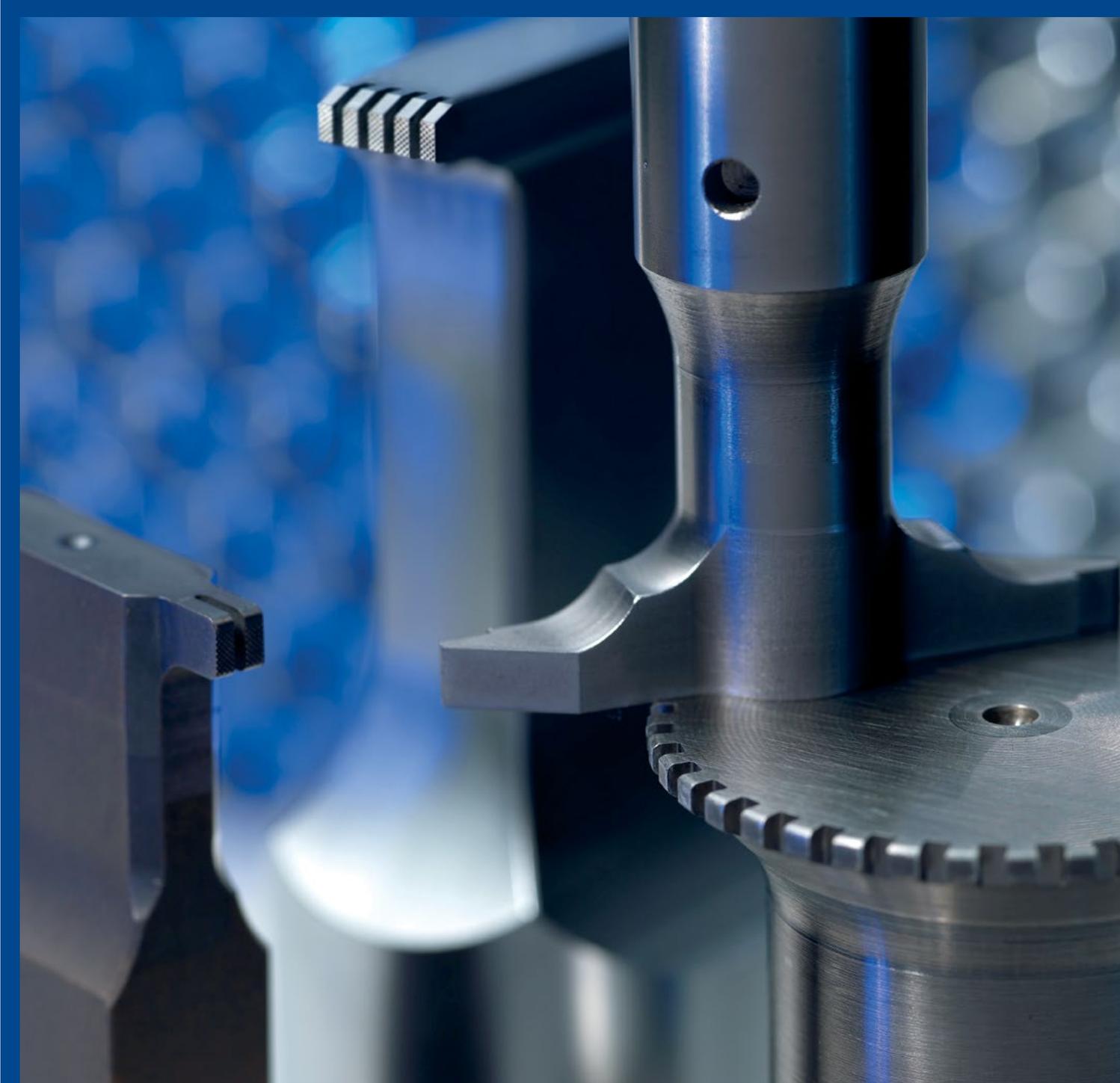
**Branson™ Ultrasonic Metal Welding Systems**  
Meeting the demand for metal assembly solutions for advanced  
technology manufacturing.



## You need to produce increasingly complex metal assemblies while keeping pace with rapidly changing market demands.



The race is on to produce reliable, advanced metal assemblies faster and more cost-effectively for everything from powerful, long-life Li-Ion batteries, to finding ways to weld a widening range of nonferrous materials. What if you could generate high-quality, metallurgical welds in seconds using clean, eco-friendly acoustic vibration technology that is easily integrated into automated systems? What if you could replace your outdated, visual QC methods with digital traceability of process parameters? Or meet the growing demands for reduced costs and increased productivity with a welding technology that requires no consumables, uses less energy than other welding methods, and is capable of delivering superior, solid-state welds that meet the demands of consumer brands and OEMs in the automotive, HVAC and electronics industries.



Instead of being limited by the traditional methods of resistance welding, crimping connectors, or soldering, Emerson can help you harness the speed, efficiency and cost savings of high-frequency acoustic vibrations to create a solid-state weld.

To learn more, visit [www.Emerson.com/Branson](http://www.Emerson.com/Branson)

## **Branson ultrasonic metal welders deliver speed, precision, safety and cost-effectiveness other welding methods can't.**

The high-quality, metallurgical welds created by our Branson metal welding systems can satisfy even the highest expectations for low joint resistance, thermal conductivity, mechanical strength and long life.

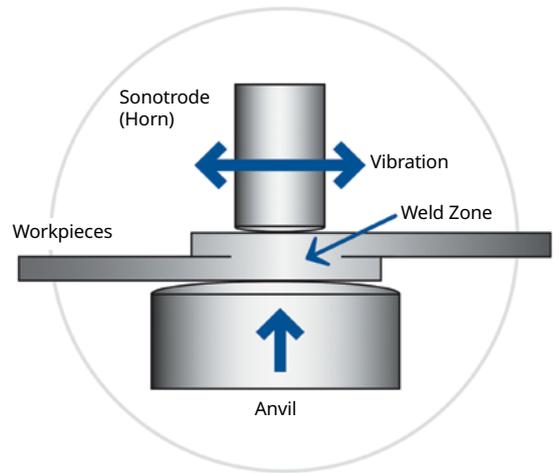
Branson ultrasonic metal welding is a high-speed welding technology that produces solid-state welds in a fraction of a second. It employs electronic process controls with digital traceability of weld parameters to ensure high quality welds and maximum productivity. There is low heat build-up and no heat or electricity directly applied to the work pieces.

Branson ultrasonic welders also offer low energy consumption, requiring just 10% of the energy used in resistance welding. Ultrasonic welding is a highly cost-effective process that requires no consumables and can weld through contaminants, eliminating your need for pre-cleaning and the cost of hazardous cleaning chemicals. They are easily adaptable to fully automated product lines for continuous batch processing, while producing weld quality that can increase energy density, improve conversion efficiency and lower energy consumption.

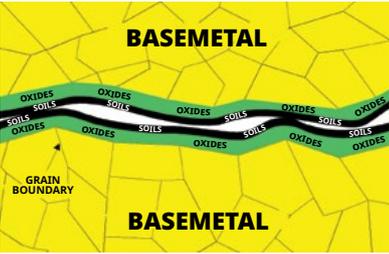
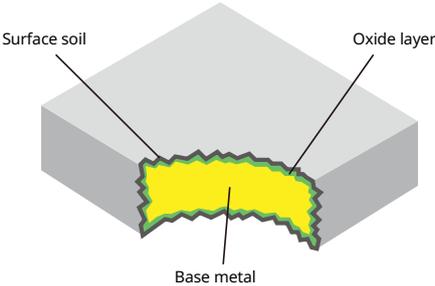
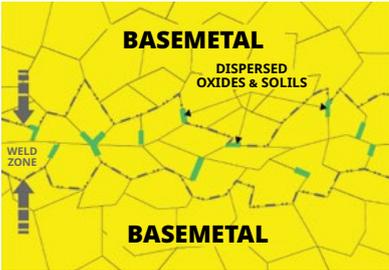


# How Branson ultrasonic metal welding produces superior performing bonds.

During the ultrasonic welding operation, the upper metal component is oscillated by the horn against the lower component. This rapid, oscillating shear force disrupts surface oxides, contaminants and asperities, creating pure metal-to-metal contact until the oscillation stops at the end of the weld cycle. The entire process is very rapid, with welds typically completed in a fraction of a second. The now-welded area is characterized by atomic diffusion across the interface of the joined parts, as the metal surfaces of the welded parts recrystallize into finely grained structures, similar to the structures of cold-worked metals.



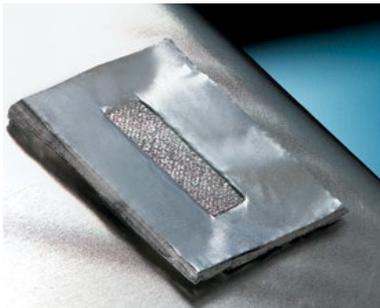
**Branson ultrasonic welders produce clean, high-strength, metallurgical welds using high-frequency, acoustic vibrations.**

Metal interface before welding	Typical metal surface conditions	Metal interface after welding
 <p>This microscopic view illustrates the oxides, contaminants, metal grain structure and typical rough surface of metal. During the welding operation, the high-frequency vibrations, under pressure, establish a shear force on the interface of the two parts being welded. These shear forces work to disperse surface soils and contamination.</p>	 <p>Illustration of the non-metallic surface contaminants and oxide layer that must be removed prior to the welding process.</p>	 <p>After welding, it is common to see a slight reduction in the metal grain size. This reduction is due to a minor amount of work hardening that occurs during the weld. The dark areas represent pockets where the contamination and oxides congregate.</p>

# Ultrasonic metal welding meets the challenge of advanced technology applications.

Ideal for welding nonferrous metals, Branson ultrasonic metal welding systems from Emerson meet the production demands of consumer brands and OEMs in the automotive, HVAC and electronics industries. Branson ultrasonic welders are able to tackle tough, nonferrous welding challenges, from joining solar panels to sealing charged tubes in air conditioners, to bonding multiple layers of smaller gauge foils such as the delicate assemblies needed for electric vehicle batteries, as well as photovoltaic cells, automotive air bag systems, capacitors and other critical components.

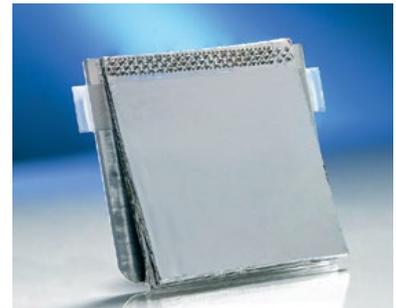
## Batteries



EV battery: 100-layer Al foil



EV battery: 100-layer Cu foil



High Power battery: Al tab + Al foil



High Power battery: Ni tab + Cu foil



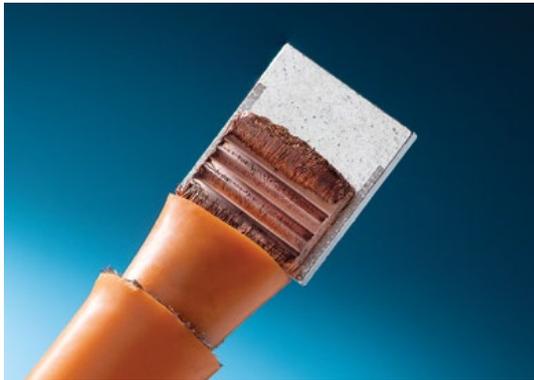
Small battery: Al tab + Al foil



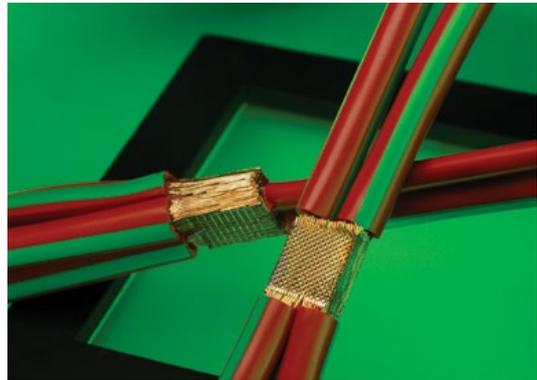
Small battery: Ni tab + Cu foil

## Other Applications

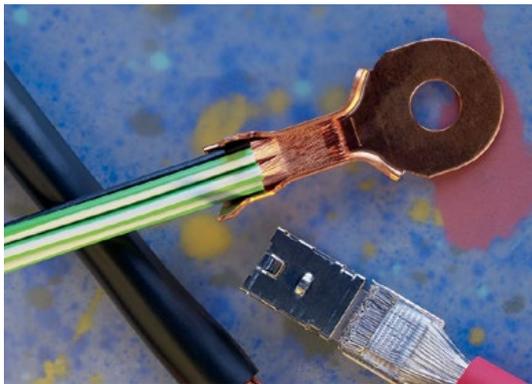
**Wire Termination**



**Wire Splicing**



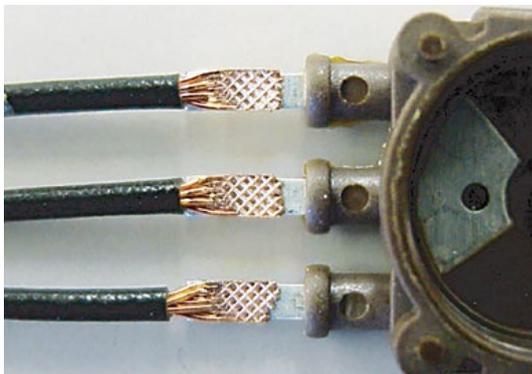
**Ground Terminal**



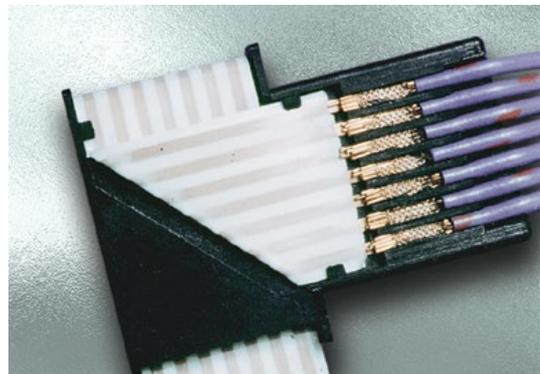
**Metal Tube Cut & Seal**



**Motor Lead Wire**



**Air Bag Sensor**



## Series GMX-Micro 5500W | 4000W



GMX-Micro D type



GMX-Micro A type

### Product overview

Branson GMX-Micro Ultrasonic Metal Welder is designed and built to assure you the highest degree of reliability and weld quality. Ultrasonic metal welding provides our customers with a superior solution, superior performance, improved throughput, and reduced maintenance.

With over 40 years of experience in metal welding, Emerson continues to lead the design of high-end ultrasonic metal welding solutions. There is a growing demand for welding larger products, more layers of thin delicate foils, and large diameter cables used in electric vehicles and charging stations. In addition, advanced battery modules, electrodes, and busbars demand thicker materials and use delicate foils and complex joints. Emerson continues to improve technology to address these challenges, providing faster, cleaner, and more reliable welding solutions for advanced industrial applications such as these.

### Key features

- **Dual linear bearings** ensure a smooth, precise welding process.
- **Rigid polar mount support** to hold the stack completely, enhance stability & repeatability.
- **Compact actuator design** with spacious underneath, suitable for automation layout.
- **Option to choose normal** or direct press stack for different application purpose.
- **New designed electronic & pneumatic** circuit support higher PPM applications (welding cycle faster).
- **Effective & efficient force** output with air cylinder closer to or directly positioned on top of the welding area.
- **Nodal support design** precisely balances the horn and anvil during the welding process. This ensures effective transfer of Ultrasonic energy for improved weld quality and consistency.
- **Precise linear encoder** enables precise height and distance control during welding to ensure welding accuracy.
- **Upgraded control & power** supply provides multiple real time welding data quality monitoring.



# Welding Systems

## Welder: GMX-20MA

### Features

- Dual linear bearings ensure a smooth, precise welding process.
- Nodal support design precisely balances the horn and anvil during the welding process. This ensures effective transfer of ultrasonic energy for improved weld quality and consistency.
- Precise linear encoder enables precise height and distance control during welding to ensure welding accuracy.



## Welder: GMX-20DP

### Features

- Unique pressure applying mechanism enables more efficient ultrasonic energy transmission.
- Lower vibration amplitude results in low heat and particulate during welding, better protecting parts through the weld process.
- Pressure trip mechanism enables accurate welding control to ensure welding quality.



## Welder: GMX-HP

### Features

- Specially developed high power welding machines with multiple welding modes and data interfaces for effective monitoring of weld quality suitable for a wide range of applications.



## Welder: GMX-W1

### Features

- 22" capacitive touchscreen for fast response time.
- User-friendly HMI
  - User-friendly intuitive interface.
  - Optimized production capability for splicing, sequencing and harness boards.
  - Multiple user level and access management.
  - Traceability for statistical evaluation and log file.



## Welding Systems



### Welder: MWX-100

#### Features

- A rugged, easily tooled welder for a wide range of nonferrous metal welding applications.
- Available in 30, 40, and 60kHz.



### Welder: GMX-L20A

#### Features

- Precision roller bearing slide assures smooth operation and extreme accuracy.



### Welder: Ultraseal 20EX

#### Features

- The Branson Ultraseal 20EX is a rigid, lightweight and ergonomic metal joining system able to seal metal tubes from 4mm capillary up to 12mm diameter.

## Power Supply



5.5kW



4kW



### L20A's & GMX-Micro's power supply

#### Features

- Ethernet 1000/100/10 Mbps for direct Branson Insights connection with MES.
- Recipe remote recall via Ethernet.



### 2000Xea / 2000Xeat's control box

#### Features

- Digital Amplitude Control — Accurate Amplitude Setting.
- Line / Load Regulation — Corrects for variations due to power line fluctuations and varying load conditions through Branson's closed-loop amplitude control.



### 2000Xc Power Supply for high power 5.5kW; 6.5kW & 8kW

#### Features

- USB barcode for recording part Unique Device Identification or recalling presets.
- 100,000 weld result histories stored.
- Digital amplitude setting and amplitude stepping.

## Service and Support Anywhere, Anytime



Our global network of dedicated experts provides first class support and advise from facilities in 70 countries, including 12 main labs and 31 regional technical centers to keep your project on target.

At Emerson, we promise aftermarket service and support for Branson equipment that is as globally available, capable, and predictable as your global operations. To support that promise, we offer 35 Branson service centers and over 170 service specialists at more than 60 locations worldwide. Our dedicated aftermarket service programs ensure 24/7 technical and onsite support, spare parts, preventive maintenance, calibration, and equipment evaluations to keep production flowing.

# Maximize precision, reliability and efficiency of your metal assemblies.



**BRANSON™** Emerson ultrasonic metal welding systems provide high-quality, metallurgical welds faster, safer, and more cost-effectively for everything from the simplest to the most-demanding applications.

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