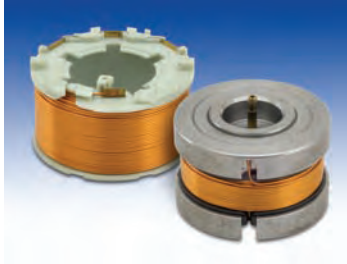




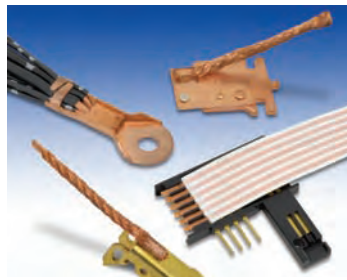
SONICS®

40 kHz **20 kHz** **15 kHz**

Sonics & Materials, Inc.



Ultrasonic Metal Welding



Features and Benefits

- Ultrasonic Metal Welding is the ideal process for bonding conductive materials such as copper, aluminum, brass, gold and silver.
- Excellent welds are achieved with otherwise difficult applications, such as welding materials that are dissimilar in thickness and composition.
- The process is environmentally green as no solders, flux or braze material are required.
- Very little energy is expended. A typical weld uses under 2000 watts and is completed in under one-half second.
- The process is a cold weld so that components are not annealed and no harmful intermetallics are formed during welding.
- The ultrasonic weld is extremely reliable with built-in process monitoring to help assure zero rejects.
- Weld tooling typically lasts for several hundred-thousand cycles with no maintenance.
- Large weld areas of up to 150 mm sq. can be produced with our 6000 watt power supply.

Sonics and Materials, Inc. manufactures ultrasonic metal welding systems in frequencies of 40 kHz, 20 kHz and 15 kHz with available power ranging from 700 to 6000 watts.

A typical metal welding bench-top system consists of an ultrasonic power supply, converter, booster, horn, pneumatic press/actuator and holding fixture.

Sonics also designs and develops custom ultrasonic welding systems, both fully automated and semi-automated, to customer production requirements.

In addition to complete ultrasonic metal welding systems, Sonics manufactures a full range of custom tooling in a variety of materials, as well as holding fixtures and components.

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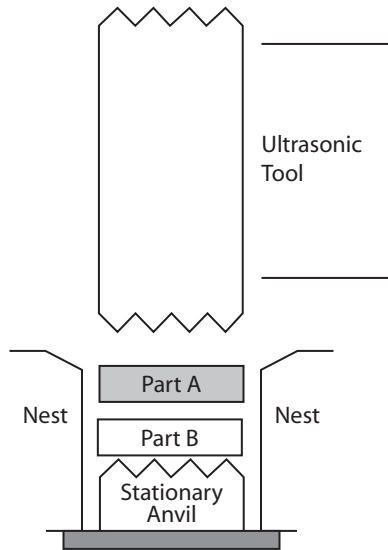
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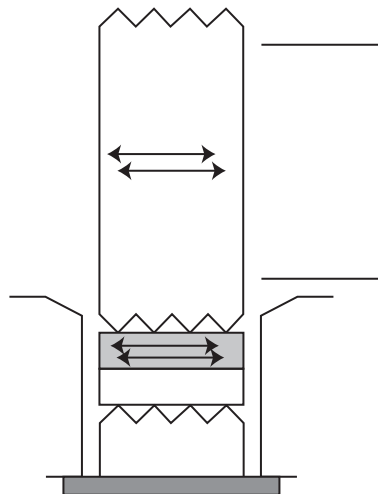
For more information: **1.800.745.1105 • www.sonics.com**

How Ultrasonic Metal Welding Works



The parts to be welded are placed into a locating nest.

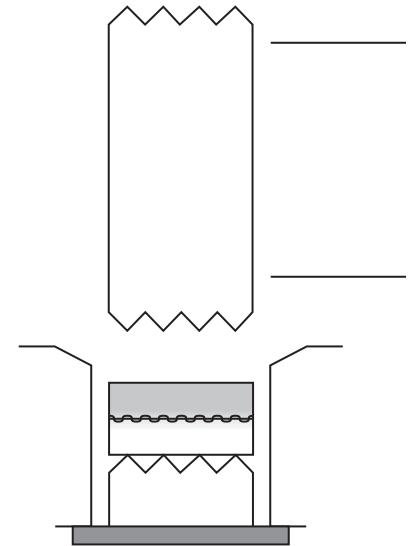
One component rests on a stationary anvil, that is serrated to grip the component and hold it still.



The ultrasonic tool descends to apply a clamping pressure between the weld parts.

The tool then vibrates at a frequency of twenty or forty kilohertz.

The weld parts are thus scrubbed together under pressure causing surface oils and oxides to be dispersed.



The base metals are then mechanically mixed causing a metallurgical bond between the parts.

The parts are immediately welded; there is no hold time or curing time.

Ultrasonic Metal Welding Equipment

Sonics has been a world leader and innovator in ultrasonic welding for over four decades. Our presses and power supplies feature cutting edge technology backed by 40 years of specialized ultrasonic experience. State-of-the-art micro-processor controls provide superior precision and consistent reliability for every application.

Standard Feature Highlights

- Automatic Frequency Tuning
- Digital Amplitude Control
- Soft-start Overload Protection
- Upper and Lower Weld Limit Settings
- Smart-logic Navigation

Sonics also offers free application evaluation and analysis in our fully-equipped applications laboratory.



Typical Applications

- Wire Splicing
- Wire Termination
- Flex Cable Termination
- Tube Sealing
- Batteries
- Heat Sinks
- Solar Panels
- Coils
- Contacts
- Switches



SONICS®

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1C/09/07

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A3787

Sonics & Materials, Inc.



SONICS®

Sonics & Materials, Inc.

Model MW20

20 kHz

Ultrasonic Metal Welding System

more Power Features



Model MW20
Welding Press



GX-Series Power Supply

Power	Available in: 1200 watts ■ 1700 watts ■ 2200 watts ■ 3500 watts
Features	<ul style="list-style-type: none"> • Simple and Precise Set Up and Operation • Optimum Operator Safety and Ergonomics • Highest Quality and Lowest Cost Welds
Quality	digital time - Model GXT digital energy with upper/lower time limits - Model GXE digital distance with upper/lower energy limits - Model GXL

STANDARD FEATURES INCLUDE:

- Automatic Frequency Tuning
- Digital Amplitude Control
- Good Part/Bad Part Output Signal
- Multiple Job Storage
- Back-Lit LCD Display
- Ultrasonics Load Meter Scale
- Upper and Lower Weld Quality Settings
- RS232 Serial Port Printer Output
- Optional PLC I/O (Input/Output) Ports
- Soft Start Overload Protection Circuitry
- Load Regulation Circuitry
- Distance Mode Settings in English or Metric Units (with Model GXL only)

Leaders in the field of ultrasonic welding equipment and technology since 1969, Sonics & Materials offers its new line of ultrasonic metal welders combined with the GX-Series ultrasonic power supply to create a powerful and precise system, designed to handle even the most demanding applications.

The GX-Series provides microprocessor control and consistent reliability for every application, and delivers more output power to the MW20 welder. Power supplies feature smart-logic, user-friendly navigation and are available in three different welding mode configurations for maximum versatility and quality.

System Specifications

System Weight: 85 lbs. (Press), 21 lbs.* (Power Supply)
 Power Supply Input Voltage: 220 VAC single phase
 Pneumatic Requirements: clean dry air at 85 psig

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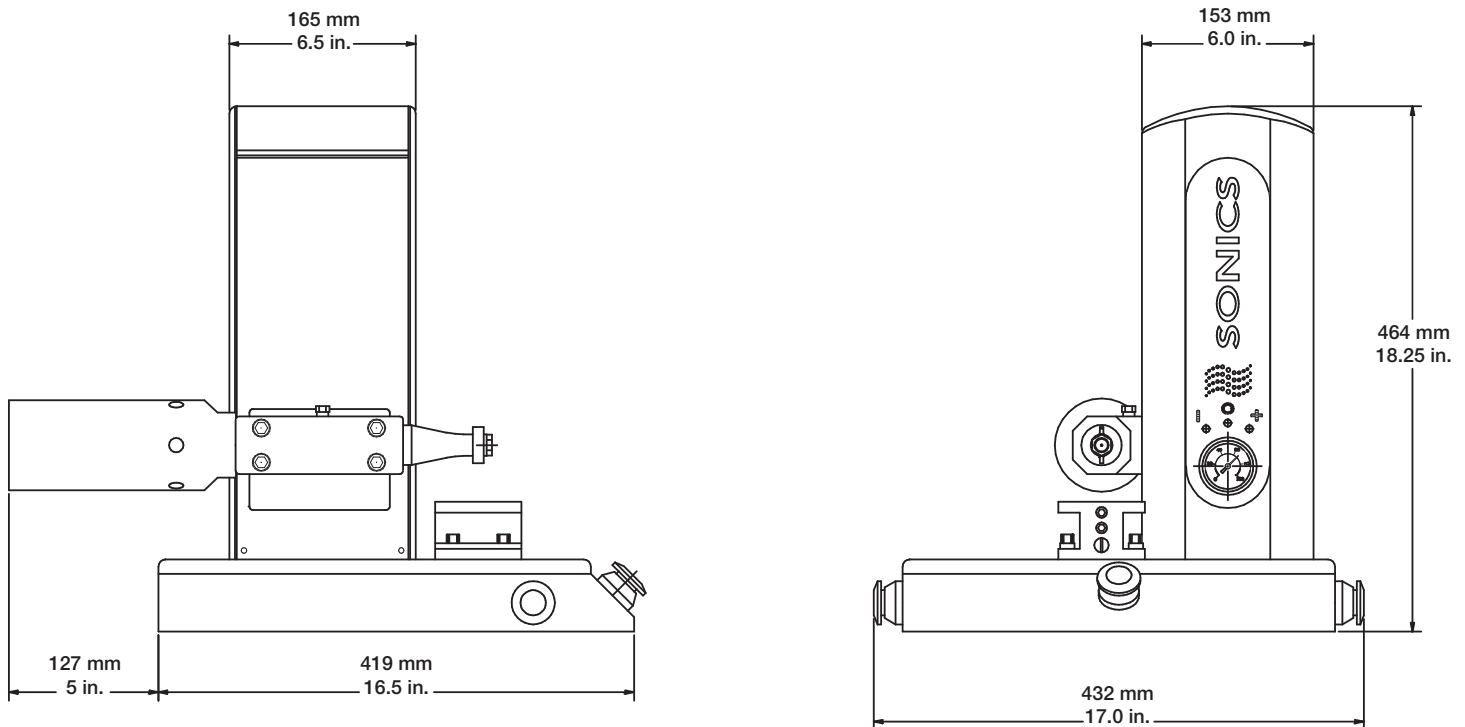
For more information: **1-800-745-1105 • www.sonics.com**

MW20 Welder Features

- Patented self-orienting horn and tips permit simple, quick and precise tool change in under one minute.
- Patented one-piece horn/booster with dual nodal mounts assures the optimum efficiency of sonic transmission and eliminates horn deflection.
- Weld quality monitoring is available in time, energy and distance.
- Micrometer adjustment of the anvil height simplifies anvil set up, anvil reconditioning and weld quality.
- Ground base provides an ergonomic work area with integrated safety switches.
- Indicator lights alert the operator on weld status, good parts and faults.
- Exclusive Sonics' safety system advances the slide at low force until it is within 1 mm of closure to protect the operator, even with foot pedal operation.
- Large anvil stage with independent x-y adjustment facilitates part fixturing.
- Hinged cover protects all adjustments from unwarranted change.
- Precision down stop with micrometer increment is provided for ease of setup.
- Precision up stop adjustment provides total motion control.
- Spring return keeps the weld head up when air is removed.
- Heavy duty cylinder and mechanical linkage provides up to 750 lb. force for 20 kHz.
- Four heavy duty linear bearings assure precise motion and weld position. Bearings are sealed and prelubricated for longest life, with a design safety factor of over 10 to 1.
- Heavy duty, all cast I-beam housing assures rigidity at maximum force.
- Independent air cooling adjustments for the converter and horn are provided, with a timed program, for optimum air conservation.
- Pneumatic valve stack provides 200 million cycles and 10 millisecond response time.

*Power supply for 3500 watt system weighs 70 lbs.

Dimensional Data





SONICS®

Model MW40

40 kHz

Ultrasonic Metal Welding System

Sonics & Materials, Inc.



Model MW40
Welding Press

more Power Features



GX-Series Power Supply

Power	Available in: ■ 400 watts ■ 800 watts
Features	<ul style="list-style-type: none"> • Simple and Precise Set Up and Operation • Optimum Operator Safety and Ergonomics • Highest Quality and Lowest Cost Welds
Quality	digital time - Model GXT digital energy with upper/lower time limits - Model GXE digital distance with upper/lower energy limits - Model GXL

STANDARD FEATURES INCLUDE:

- Automatic Frequency Tuning
- Digital Amplitude Control
- Good Part/Bad Part Output Signal
- Multiple Job Storage
- Back-Lit LCD Display
- Ultrasonics Load Meter Scale
- Upper and Lower Weld Quality Settings
- RS232 Serial Port Printer Output
- Optional PLC I/O (Input/Output) Ports
- Soft Start Overload Protection Circuitry
- Load Regulation Circuitry
- Distance Mode Settings in English or Metric Units (with Model GXL only)

Leaders in the field of ultrasonic welding equipment and technology since 1969, Sonics & Materials offers its new line of ultrasonic metal welders combined with the GX-Series ultrasonic power supply to create a powerful and precise system, designed to handle even the most demanding applications.

The GX-Series provides microprocessor control and consistent reliability for every application, and delivers more output power to the MW40 welder. Power supplies feature smart-logic, user-friendly navigation and are available in three different welding mode configurations for maximum versatility and quality.

System Specifications

System Weight: 20 lbs. (Press), 21 lbs. (Power Supply)
 Power Supply Input Voltage: 220 VAC single phase
 Pneumatic Requirements: clean dry air at 85 psig

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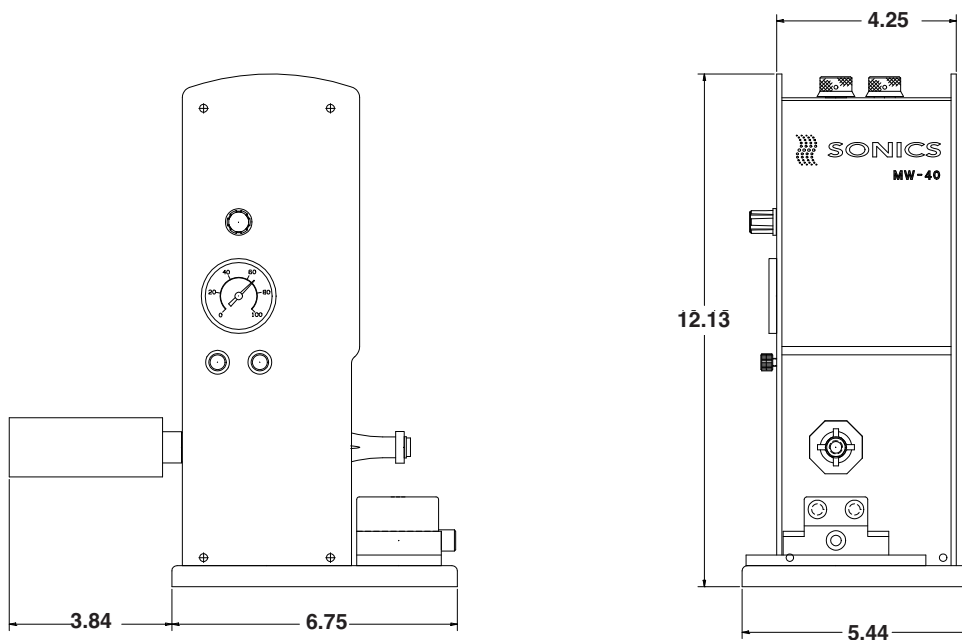
For more information: **1-800-745-1105 • www.sonics.com**



MW40 Welder Features

- Patented self-orienting horn and tips permit simple, quick and precise tool change in under one minute.
- Patented one-piece horn/booster with dual nodal mounts assures the optimum efficiency of sonic transmission and eliminates horn deflection.
- Weld quality monitoring is available in time, energy and distance.
- Precision down stop with micrometer increment is provided for ease of setup.
- Precision up stop adjustment provides total motion control.
- Heavy duty linear bearings assure precise motion and weld position. Bearings are sealed and prelubricated for longest life, with a design safety factor of over 10 to 1.
- Independent air cooling adjustments for the converter and horn are provided, with a timed program, for optimum air conservation.
- Pneumatic valve stack provides 200 million cycles and 10 millisecond response time.
- Optional base provides an ergonomic work area with integrated safety switches.
- Optional large anvil stage with independent x-y adjustment facilitates part fixturing.

Dimensional Data



Model MWS20

20 kHz

Ultrasonic Wire Splicing System

Sonics & Materials, Inc.



Model MWS20
Wire Splicer



SmartControl Touch Screen Power Supply

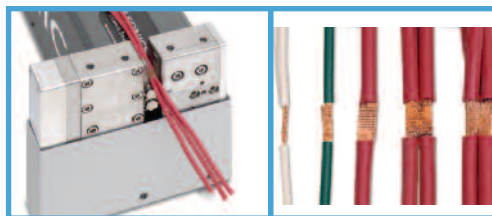
Power	Available in: 1200 watts ■ 1700 watts ■ 2200 watts ■ 3500 watts
Features	<ul style="list-style-type: none"> • Fully automatic splice set-up from 0.5 mm to 40 mm² and beyond • Lowest cost per splice (low cost multi-faceted tools, no consumables) • Maximum productivity and ergonomics
Quality	<ul style="list-style-type: none"> • Highest splice quality • Superior reliability • 100% process monitoring

STANDARD FEATURES INCLUDE:

- Automatic Frequency Tuning
- Digital Amplitude Control
- Good Part/Bad Part Output Signal
- Multiple Job Storage
- Digital Pressure Setting
- Ultrasonic Power Graph
- Upper and Lower Weld Quality Settings
- Precise Splice Height/Width Control
- Automatic Sequencing between Splice Sizes
- Soft Start Overload Protection Circuitry
- Load Regulation Circuitry
- Pre-weld height test to confirm proper loading
- Counters for maintenance and production

Leaders in the field of ultrasonic welding equipment and technology since 1969, Sonics & Materials offers its new line of ultrasonic wire splicers combined with the SmartControl ultrasonic power supply to create a powerful and precise system, designed to handle even the most demanding splice applications.

The SmartControl power supply provides microprocessor control with full-color touch screen operation. User-friendly navigation and vivid graphics highlight multiple menus designed for easy splice set-up and precision splice quality control.



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CELEBRATING

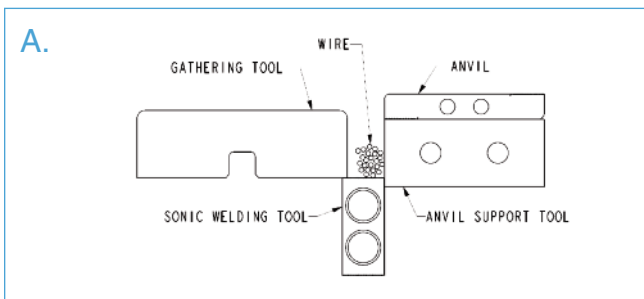
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YEARS

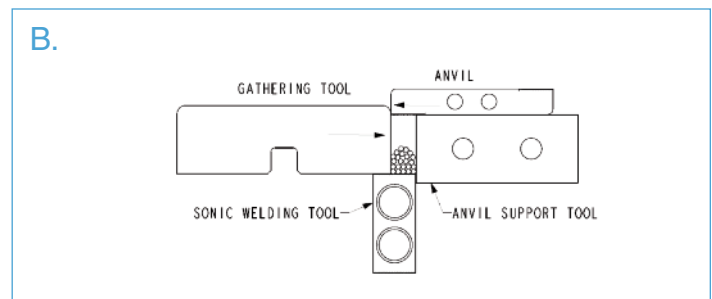
MWS20 Welder Features

- Memory storage library of over 1,000 preset splices including all weld parameters & quality limits
- Memory storage of 100 sequences with up to 16 splices in each sequence
- Operator-friendly, color touch screen control system
- Automatic splice width adjustment from 0 to 12 mm
- Auto pressure setting to control weld force
- Auto amplitude setting from 15 to 65 microns
- Auto energy setting from 0 to 10,000 joules
- Patented self-orienting horn permits simple and precise tool change in under one minute
- Patented one piece horn/booster with dual nodal mounts assures optimum efficiency of sonic transmission and eliminates horn deflection
- Replaceable four-sided welding tip assures lowest tool cost and simple replacement
- Heavy duty linear bearings assure precision motion and no flash.
- Bearings are sealed and prelubricated for longest life

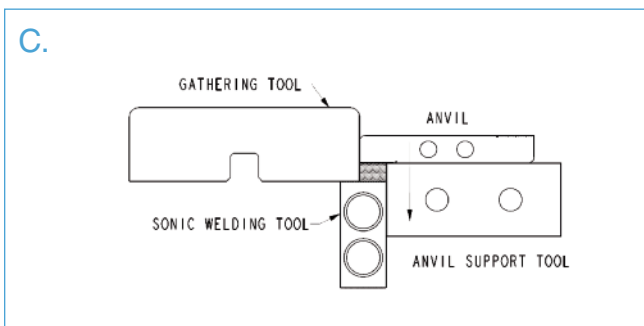
Splice Process



The operator places the wires to be spliced into a large nest and activates the start switch.



The anvil tool advances and the gathering tool closes to the pre-set splice width.



The anvil then descends to apply weld force to the splice. Ultrasonic vibrations gaul the wire strands together to form a true metallurgical weld of the splice.

System Specifications

System Weight: 35 lbs. (Splicer), 21 lbs.* (Power Supply)

Power Supply Input Voltage: 220 VAC single phase, 15A

Pneumatic Requirements: clean dry air at 85 psig, 6.0 Bar

*Power supply for 3500 watt system weighs 70 lbs.

Process Controls

The “pre weld height” of the wires is measured and compared to the “pre-height limits”. If the height is outside the limits the cycle is aborted and the operator is alerted to the wire loading error.

With the pre-height test satisfied, ultrasonic vibrations scrub the wire strands at 20 kHz to remove surface oxides and contaminants.

A precise amount of ultrasonic energy is applied to produce the weld, thus if there is a variation in the amount of oxidation or contaminants on the wire strands, the weld cycle is automatically extended to disperse the oxides and achieve optimal weld results.

The welded splice is measured to confirm proper compaction and splice quality.