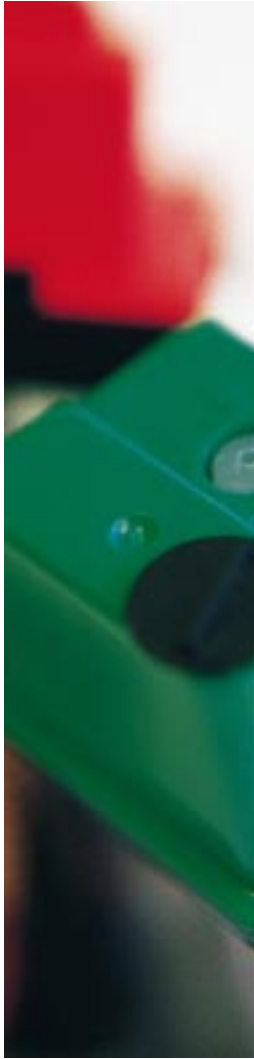


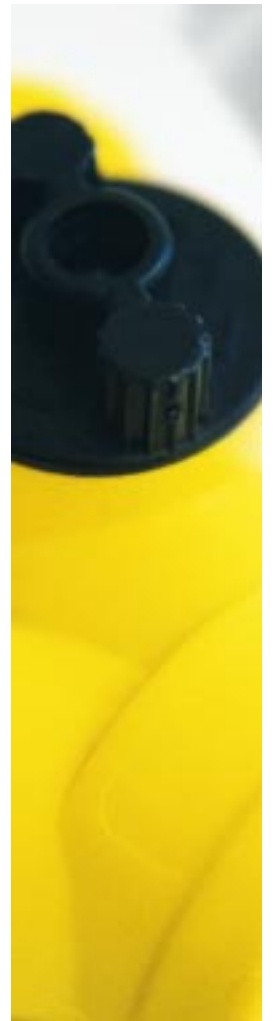
# BRANSON



*Applied Technologies*

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*Plastics Joining Solutions*



# Ultrasonic Assembly

**U**ltrasonic assembly uses ultrasonic vibratory energy which is transmitted through the parts to melt and bond thermoplastic materials. This technique is fast, efficient, non-contaminating and requires no consumables. In addition to welding, ultrasonic processes can be used to insert, stake, stud weld, degate, and spot weld thermoplastics as well as seal, slit, and laminate thermoplastic films and fabrics.



areas. They are available with a pistol grip or sleeve with the trigger switch on the side for versatility in operation.

## Automation/OEM Components

Ultrasonic equipment can be easily integrated into automated systems. Branson nurtures OEM partnerships, working with customers to retrofit existing equipment or execute new designs. It is this partnership that makes Branson's line of OEM components unique.

Available equipment includes an industry standard rack design that enables the user to install up to four power supply modules, panel-mount power supplies that can be directly mounted into electrical enclosures, and custom converters. The converters include CIP ("clean in place") models, the SST converter for use with servo mechanisms, and the compact 7" side-mount converter.

Branson also manufactures a sequencing unit which allows one power supply to power up to eight actuators, providing additional versatility for automation.

## And more ...

Branson ultrasonic equipment is also configured for processing textiles and films. Special equipment includes "sewing machine" units, ultrasonic slitting devices, hand-held ultrasonic trim knives, and in-line clamshell sealers for maximized production rates.

## Process Control

Branson offers CompuWeld 2000™ software for our 2000 Series ultrasonic welders for SPC capability and advanced data collection. Any weld parameters and resultants such as time, amplitude, frequency, energy, or distance that are available digitally from the welder can be captured and stored in a database, displayed graphically, and used in SPC calculations. The ability to view, collect, and manipulate weld data gives users a wealth of information, which can help improve productivity and quality control. CompuWeld 2000 is also backward-compatible with Branson 900 Series welders.

## Ultrasonic Equipment

Branson's 2000 Series ultrasonic assembly systems are available in several levels of control, including time, energy, energy compensation, distance, and force. They are designed for superior performance, ease of use, and data management. These systems include an enhanced UPS power supply module with Branson's patented closed loop circuitry providing superior performance, consistency, and reliability.

2000 Series systems are available in 15, 20, 30, and 40 kHz. The power supplies have increased power output for three of these frequencies: 20 kHz units are rated at 1100, 2200, and 3300 Watts; 30 kHz is available in 1500 Watts; and 40 kHz are available in 400 and 800 Watts. The 15 kHz systems are rated at 3300 Watts. New low power units are rated at 150 and 500 Watts; and new high-power units are available at 6000 Watts.

Branson also offers a 2000 Series Integrated Welder which combines power supply and welder in one benchtop unit. Integrated welders are available with distance welding capability.

All Branson systems may be used in manual, semi-automated, or fully-automated environments. The actuator may be mounted directly to a machine frame, with a fixed support on a column and hub, or as a stand-alone system on a base with ergonomic light-force palm button switches.

Hand-held welders – available in 20, 30, and 40 kHz – are compact, light-weight tools ideal for assembly of large parts or those with hard-to-reach joint

# Vibration Welding

**V**ibration welding uses the frictional heat generated at the joint interface of two parts to be welded to melt the plastic. Two methods are available from Branson: linear and orbital vibration welding. With linear welding, the heat energy is achieved by moving one part relative to its mating piece under pressure through a given displacement or amplitude. With the orbital process, the upper section is vibrated using constant velocity orbital motion – circular motion in all directions. With both processes, once the desired amount of weld has been achieved, vibration is stopped, and the parts are held together under a clamp force for a short period of time, allowing the weld to solidify.



## Vibration Welding Equipment

Branson's vibration welders are designed to withstand the abuses typically encountered in a rugged industrial environment. They offer state-of-the-art process control, improved ergonomic features, rapid setup capability, and meet all safety regulations. Several different-sized models are available. Depending on the model, standard linear vibration welders can assemble parts of any size up to 55" long by 20" wide. Multiple parts per cycle can also be welded. Three series of linear vibration welders are available - L Series, Hy-Line, and Ultra Hy-Line, offering multiple control levels. In addition, Branson offers the Mini II vibration welder; with a footprint of only 36" by 38", this welder will handle parts up to 7" by 9".

Orbital vibration welders can operate at low weld amplitudes – less than 0.030" in some applications, which reduces part clearance requirements and enables welding of unsupported vertical walls. Parts up to 12" in diameter may be orbital welded. Constant velocity orbital motion results in more welding power in short weld times. Omnidirectional motion enables welding of taller, unsupported vertical walls. No wall is ever perpendicular to welding motion since motion is in all directions.

Standard features include closed loop amplitude control, adjustable frequency, and ergonomically designed opto-touch sensors. New process verification software for validating weld quality on critical applications is also available.

## Laser IRAM Welding

**L**aser IRAM is an innovative welding technique based on the STTir™ (Simultaneous Through Transmission Infrared) principle where laser energy is passed through one plastic component (transmissive part) and absorbed by the second component (the absorptive part). This absorption results in heating and melting of the interface, and, with the application of a controlled clamp force, the parts are joined.

## Laser IRAM Welding Equipment

Typically, two modes are available for Laser IRAM welding: Simultaneous (STTir) illuminates entire weld surface simultaneously using laser diodes and fiber optics; and Wide-beam Scanning which is used for laminating or welding large surface areas as well as internal walls. A major breakthrough in Laser IRAM technology is the ability to illuminate the entire welding surface simultaneously compared to moving a spot laser around the periphery of a part.

Laser IRAM equipment is fast and flexible. A typical cycle time ranges between 3 and 5 seconds. Laser IRAM is also a "pre-assembled" method – the parts are placed into the machine in the same position and orientation as the final, assembled position.



# Spin Welding

**S**pin welding joins thermoplastic parts with a circular joint area by bringing the part interfaces together, under pressure, with a circular, spinning motion. One part is held stationary in a fixture, while the other is rotated against it under pressure. At least one section must be circular. The frictional heat that is generated causes the part interfaces to melt and fuse together, creating a strong, hermetic seal.



## Spin Welding Equipment

Spin welders are available in servo-powered or inertial models. The SW200 Series spin welders are precision servo-driven spin welding systems which allow radial tool orientation within 1°. Branson spin welders are easy to use – either as free-standing units, or integrated into automated systems.

Primary control of the system is through an operator interface, which allows for RPM (revolutions per minute) control from 250 to 7000 RPMs (depending on model), revolutions per cycle and hold time. The controller monitors these in addition to motor torque for quality control monitoring.

A dual servo model is available with servos controlling both the rotation and weld depth.

# Hot Plate Welding

**H**ot plate welding is a direct thermal welding technique that uses a heated platen to contact the mating surfaces of the parts to be assembled. This technique permits a wide latitude in designing parts with complex, irregular shapes – the joint can be curved in all planes, and welding of internal walls is possible. It is applicable to most thermoplastics, and is especially effective on semi-crystalline resins such as polyethylene and polypropylene. The process is suitable for parts up to 72" x 24" or multiple smaller parts.

## Hot Plate Welding Equipment

Hot plate welding equipment is designed with either vertical or horizontal temperature-controlled heat platen assemblies. (The hot plate welder shown uses a horizontal heat platen.) The part surfaces are melted by contact with the heat platen and then precisely pressed together to form a final assembly. Servo-driven models are also available, giving the user greater control over weld results than is possible with conventional mechanical stops.

Larger custom systems are available for even larger parts, including a pallet welder for parts up to 60" x 48". This is a flow-through machine where the operator places one half of the part on top of the other (the parts are designed with self-aligning features) and slides them into the machine on ball supports. After automatic clamping of the two halves, the weld cycle takes place, and after cooling the welded assembly is ejected out the back of the machine. The estimated cycle time is one minute.



# Markets and Applications

More than thirty years in the plastics joining industry have provided Branson with the knowledge and expertise needed to meet the specialized requirements of the markets we serve. These are a few examples of products that are assembled with Branson plastics joining processes:

## Automotive

Instrument panels, glove box/knee bolsters, instrument clusters, interior trim, HVAC housings, intake manifolds, bottles, carbon canisters, electronic modules, resonators, exterior lighting.



## Medical

Cardiometry reservoirs, blood & gas filters, IV spikes, drug delivery systems, face masks, implantable devices, insulin pumps, surgical gowns.



## Packaging

Condiment dispensers, blister packages, juice pouches, juice/milk cartons and spouts, pantyhose packages, plastic coated paper cups, toothpaste tubes.



## Textiles & Film Technology

Quilted and laminated fabrics, bedspreads, mattress pads, diapers, hook and loop materials.

## Business & Consumer Electronics

Inkjet and toner cartridges, cell phones, media storage devices, battery packs, connectors, sensors, audio/video cassettes, floppy/micro disks.



## Appliance

Steam irons, pump housings, vacuum cleaner subassemblies, dishwasher spray arms, refrigerator components.



# Choosing a Process

Branson offers a wide range of plastics joining processes to provide the best solution to your assembly needs. Process selection is not an absolute, and more than one process could be appropriate. Your choice ultimately depends on your part material, part geometry and size, process capability volume, and cycle time, plus the capital investment, and level of service and support you require. The matrix below rates various application characteristics according to the suitability of each process. These recommendations are based on empirical knowledge and should be used as a starting point for feasibility testing. Branson can help you make the best choice with confidence, because we offer the highest level of technical expertise along with quality plastics joining equipment.

## Joining Process Comparisons

Characteristics		Ultrasonic Welding	Linear Vibration Welding	Orbital Vibration Welding	Spin Welding	Hot Plate Welding	Laser IRAM Welding
Material	Amorphous Thermoplastics	★	★	★	★	★	★
	Semi-Crystalline Thermoplastics	✓	★	★	★	★	★
	Olefins	✓	★	★	★	★	★
	TPRs	X	✓	✓	✓	✓	★
	Composites	✓	✓	✓	✓	✓	★
Part	Thin Walls	★	X	✓	★	★	★
	Complex Geometry	✓	★	★	✓	★	✓
	Large Parts	✓	★	✓	X	★	✓
	Small Parts	★	★	★	★	★	★
	Internal Welds	★	✓	✓	✓	★	★
	Long Unsupported Walls	★	X	✓	✓	★	★
	Thermoplastic Fabrics	★	✓	✓	X	✓	X
	Thermoplastic Films	★	✓	✓	X	✓	X

★ Recommended

✓ Limited

X Not Recommended

# Nationwide Service and Support Network

**B**ranson is your *Plastics Joining Technology Expert!* Now, for *ultrasonic assembly, linear and orbital vibration welding, spin welding and hot plate welding equipment, technology, and applications expertise, you need to know only one name – Branson.*

Branson is a global company with facilities throughout Europe, Asia, and the Americas. Branson is an ISO 9001-2000 certified firm and most Branson equipment is CE compliant.

In North America, Branson maintains Regional Customer Technical Centers in major industrial areas. The technical centers contain fully-equipped plastics joining applications labs for feasibility testing, and are staffed by applications development specialists to provide you with local assistance. In order to get horns and fixtures to you as quickly as possible, Branson has included horn manufacturing facilities in five of the regional centers. For your tooling needs – for superior quality, and fast delivery at competitive prices – contact the regional center nearest you:

**Northeast Region**  
17 Everberg Road, Unit C  
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**Southeast Region\***  
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