

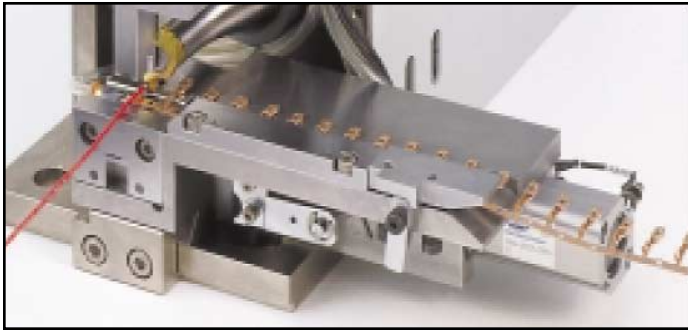
Automated Ultrasonic Wire Termination System



The AmTech Sonic Terminal Press joins wires to terminals by ultrasonic welding to provide the highest connection quality and versatility to join multiple wire sizes.

Ultrasonic wire termination provides the following advantages:

- The ultrasonically welded connection is a true metallurgical bond that withstands extreme environments.
- Four dimensional, real time quality control assures utmost reliability.
- Welds a wide range of wire sizes to one common terminal to minimize manufacturing cost and inventory.
- Eliminates tool changes and down time for set up of different wire sizes.
- Ultrasonically welded terminals do not require plating.
- The AmTech Sonic Terminal Press is easily integrated onto automated wire prep machines.
- This high-speed system produces up to sixty terminations per minute.



AmTech's Sonic Terminal Press welds wire to terminals utilizing efficient ultrasonic energy. The wire insulation is crimped to provide strain relief and the carrier is automatically cut off

Description of Process

Ultrasonic welds are produced when the wire strands are vibrated against the terminal at 20,000 cycles per second. The rubbing action that occurs disperses surface oxides and mixes the base metals. Electrons are then free to migrate forming a true metallurgical bond. The ultrasonic bond has lower resistance than the wire or terminal and withstands extreme temperature, humidity and vibration. In order to produce an ultrasonic weld the terminal and wire must be free of tin or solder. This is an advantage for the environment and allows recycling of the carrier strip material.

Ultrasonic welding is compatible with many terminal designs, materials and plating options.

Recommended terminal materials:

- Copper
- Aluminum
- Nickel
- Phosphor bronze
- Lead Free Brass
- Beryllium copper

Though no plating is preferred, the following platings are acceptable:

- Nickel
- Silver
- Gold
- Bright Dip

Power Requirements:

220 volts - 15 amp single phase

3000 watt power supply

Air at 60 psig minimum (4 bar)

Wire range 0.22mm² to 35mm²

Sequence of Operation

- 1 - Wire is placed by operator or automated mechanism and cycle is started.
- 2 - The wire is measured to assure that the correct volume has been presented (no insulation, no cut strands). If the pre-height measurement is not within preset limits the cycle is stopped with the terminal and wire held in the tooling. A reset button must be pressed to release the suspect parts.
- 3 - Acceptable pre-height measurement signals the weld cycle to begin. The weld is inspected for final height, power usage and weld time. All quality checks must be within preset quality limits. If any quality limit is exceeded the assembly is held in the tooling until the operator activates a reset button to release and discard the suspect assembly.
- 4 - Upon completion of the weld cycle, the tooling retracts and a new terminal is advanced in to the weld nest. The total cycle time is dependent on wire size, but is typically under one second for wire sizes up to 5mm².