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Ultrasonic technology provides Electro-Canada with superior weld integrity in assembly of wire harnesses

WEST CHESTER, Pennsylvania
Ultrasonic metal welding equipment from Sonobond Ultrasonics is helping Electro-Canada improve their metal welding capability and reduce cost. The Toronto-based manufacturer provides wire harnesses for the automotive industry, as well as off-road vehicles.

Metal welding using ultrasonic technology has distinct advantages over mechanical assembly devices and soldering techniques. In the case of Electro-Canada, neither mechanical nor soldering were providing reliable, consistent bonds. According to Tibor Maknyik,

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Sonobond's ultrasonic metal spot welder can be equipped with a special tooling for wire harness assembly (inset)

Manufacturing and Tooling Manager for Electro-Canada, they "were messy, time consuming, and weren't giving us the weld integrity we needed." Ultrasonic equipment from Sonobond provided the solution. Says Maknyik, "Now we're experiencing much better weld integrity, and our running cost is much more inexpensive." Maknyik attributes the improved productivity not only to the ultrasonic technology, which provides precision metal

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welding in a fraction of a second, but also to Sonobond's tooling apparatus, which is easy to remove and replace, and can last for several months.

Tooling is key to improved performance and cost effectiveness

Electro-Canada has achieved optimum weld performance and productivity using Sonobond's WS-2014D ultrasonic metal welder series with specialized tooling for wire processing. The heat-treated tool steel Taper Lock Tips can perform up to 300,000 welds. The impact on Electro-Canada's productivity is significant. Says Maknyik, "The tooling wear with Sonobond's equipment is much less than with other welders." As a result, the tips do not have to be replaced as frequently, so there is less downtime. The relatively low cost of the tooling for the Sonobond machines is also affecting Electro-Canada's bottom line. Adds Maknyik, "A set of the Sonobond tooling costs under \$1000, whereas others can cost 3 or 4 times that amount. Sonobond's

equipment costs less and runs a lot longer."

Another advantage of the Taper Lock Tips is that they are easily removed and replaced, and they don't have to be recalibrated after changing. The installation is similar to inserting a Morse tapered drill bit in a drill press. This convenient replacement method results in a tip that is always in alignment. Janet Devine, President of Sonobond Ultrasonics, explains. "Our welders are configured to eliminate the need to rotate the entire sonic system, and struggle with alignment to expose a new tip surface. The system is self-seating, so it is automatically aligned by virtue of its design."

Wedge-Reed system best suited for ultrasonic welding

Sonobond's ultrasonic equipment uses the patented Wedge-Reed coupling system that consistently provides the most reliable, repeatably accurate welds of any ultrasonic welder in the market. The system is a unique process that

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uses a vertical, vibrating reed, driven by a transducer and horn perpendicular to the reed. This provides a low amplitude, high impedance combination, and directs the energy in a shear mode...an essential requirement for ultrasonic metal welding. Says Devine, "The Sonobond equipment provides the shear motion, while putting the line of force directly over the parts to be welded. That's a distinct advantage over Lateral Drive technology, which is cantilevered." The WS-2014D performs spot welds in a single pulse, and although the welding rate depends on the thickness and type of materials used, according to Devine, most welds are completed in less than 1.5 seconds.

Welds controlled by time and energy used

To control weld quality, Electro-Canada uses Sonobond's standard 1500 watt power supply with an optional energy monitor. This allows pre-selection of an energy level (watt-seconds) to achieve the weld, as well as the maximum time allowed to reach that level. The monitor/controller provides quality control assurance,

measuring actual energy used in joules, and indicating any defective welds."

In addition to providing options for weld control systems, Sonobond also custom-designs the equipment for specific applications. For Electro-Canada, Sonobond provides a sonic cutout switch, which stops the machine immediately after the weld cycle is complete. The specialized tooling helps Electro-Canada improve productivity and extends the life of the welding tips.

With its long-lasting tooling and the ability to produce precise, dependable welds, the WS-2014D has become one of the most reliable machines of the Electro-Canada production process. "It's our workhorse," says Maknyik.

In 1960, Sonobond, formerly known as AeroProjects, received the first patent ever awarded for ultrasonic metal welding, and today continues to be a worldwide leader in the application of ultrasonic bonding technology. Sonobond also provides ultrasonic bonding equipment for textile and plastic assemblies.

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