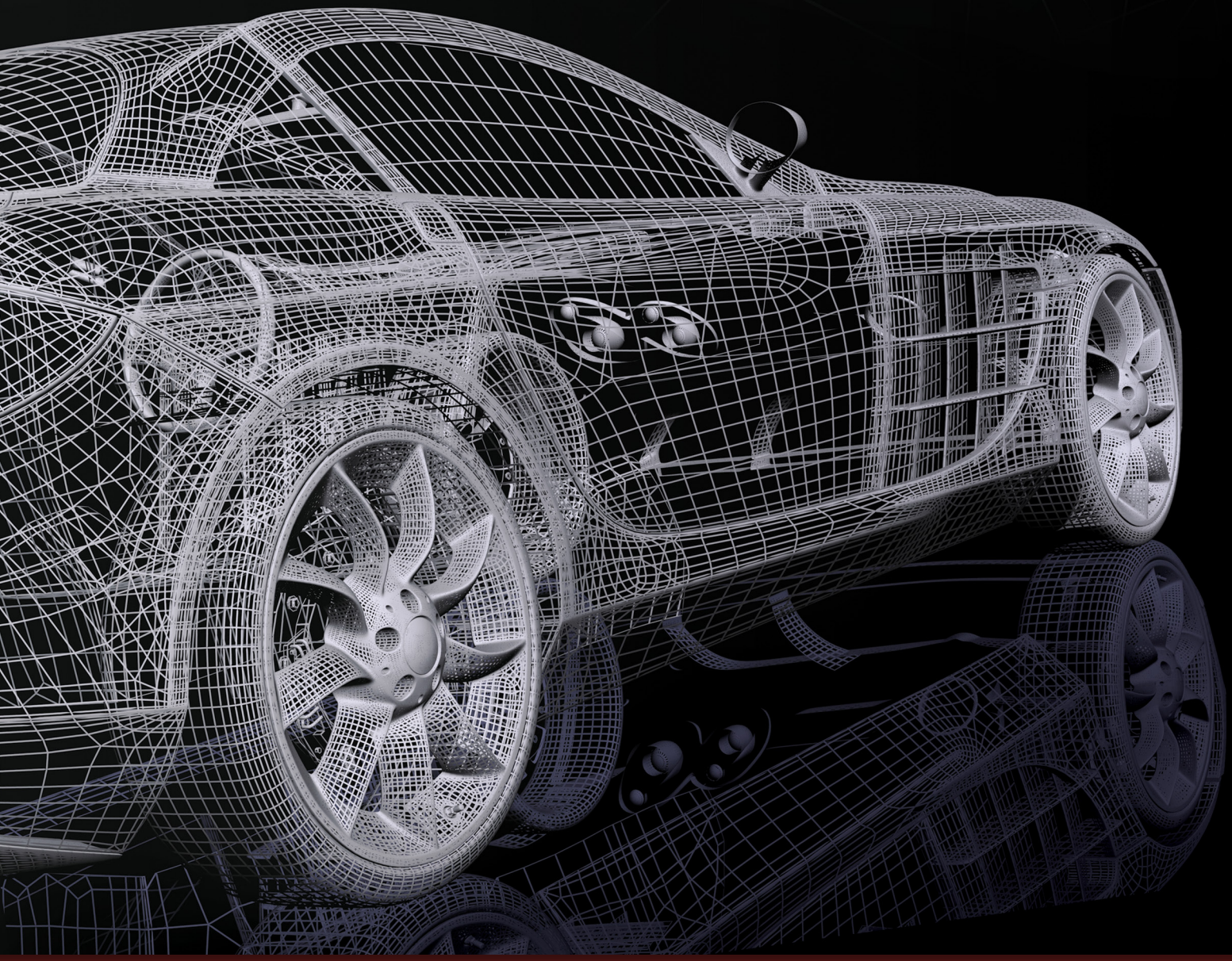
AMADA

AMADA WELD TECH

Advanced Products and Solutions for

Automotive Component Manufacturing

xEV • e-Mobility • ICE



Develop and Manufacture Next Generation Components

Cutting Edge Technologies for Advanced Applications

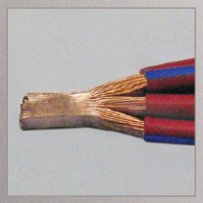
Batteries
- Terminal welding
- Can sealing
- Battery pack welding

Mechanical Components
- Copper hairpin welding and repair
- Resistance and laser welding of steering columns
- Resistance welding wire tangs

Part Identification
- Laser marking metal and plastic components
- VIN
- Serial numbers
- Barcodes
- 2D codes

Wiring and Connectors
- Hot crimping
- Wire compacting
- Resistance welding
- Laser welding

Safety Critical Components
- Sealing air bag canisters
- Squib wires



Electric Powertrain / E-axle
- Wire compacting
- Resistance welding
- Laser welding
- Wire assembly
- Hot crimping

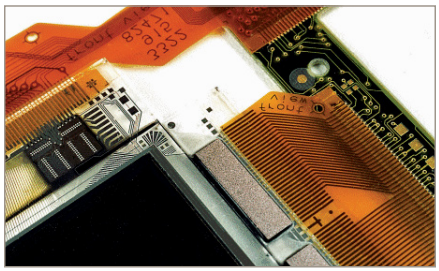
Automotive Sensors
- Reflow soldering of flexible circuits
- Heatstaking on PCBs
- Laser welding terminals

Auto Body
- Resistance welding hot stamped boron steel

Reliable Connections for Automotive Sensors & Safety Critical Parts

Modern automobiles are full of electronic components and sensors that keep track of everything happening in the vehicle enabling the onboard computers to make decisions about things like engine performance, emissions, safety, passenger comfort and more. In recent years, there has been exponential growth in the number of sensors related to driver and car safety-collectively ADAS (advanced driver assist systems) - and it is critical that the electrical connections that make them work be secure and repeatable.

Automotive Oxygen Sensors • Pressure & Temperature Sensors
Rearview Cameras • Squib Wire Welding • Air Bag Initiator Cans • Brake Sensors



Critical camera/computer connections

Air bag cylinders

Pressure sensors

AMADA WELD TECH provides technology solutions to the world's leading automotive OEMs, Tier 1 and Tier 2 suppliers according to the customer's unique application, manufacturing facility and budget including resistance welding, laser welding and hot bar reflow soldering configured for single operator, semi-automated or automated production.

Part Identification:
Global Tracking & Tracing

Today's automotive manufacturers know that part identification and traceability are critical for success. Components need to be marked with both human and machine readable characters which may be alphanumeric (serial numbers, etc.), datamatrix codes or both in order to facilitate quick identification. This is especially important for safety critical parts like airbag housings, ADAS, sensors and more. Lasers are uniquely suited for this application as they are a direct part marking method capable of delivering precise energy to parts with a minimal heat affected zone resulting in high throughput and eliminating rework and post-processing steps. Lasers are capable of marking both metal and plastic components.

High Contrast Marks • High Throughput • Traceability • Ensuring Quality

VIN numbers

Critical components

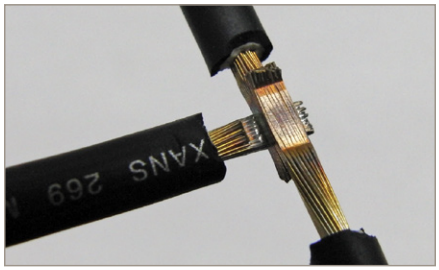
Brake assemblies

AMADA WELD TECH provides laser engines for automation, desktop and floor standing Class I systems with for low volume production and R&D manufacturing, and fully automated bespoke systems. Every laser is delivered with a process developed by our experienced applications engineers, informed by your requirements. Enhance your productivity with: barcode job loading, tie to ERP/MRP, industry 4.0 ready, vision and fixtureless marking.

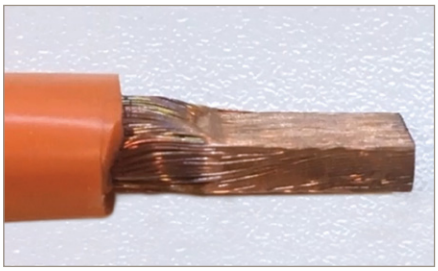
Robust Connections for E-axle, Electric Powertrain and Wiring Assemblies

Today's electric vehicles need to be powerful, fast and efficient; they need to be able to go farther, faster on a single charge and the cables and connections that make up their central nervous systems must be fault free and robust enough to ensure performance throughout the serviceable life of the car. For flexibility and robustness, stranded wire is often used to create cable harnesses but has a tendency to fray and create short circuits. Wire compacting creates a solid surface to improve contact and reliability of these connections.

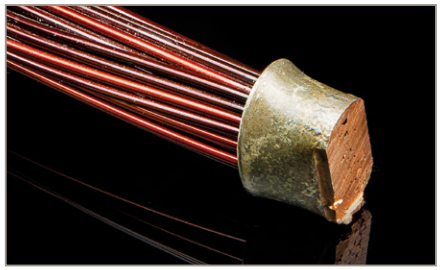
BENEFITS INCLUDE: Improved Electrical Connection • Reduced Weight Reduced Contact Resistance • Improved Connection FootprintReduced Mechanical Stress Load • Increased Product Lifespan • Cost Reduction



Wire compacting / terminal welding

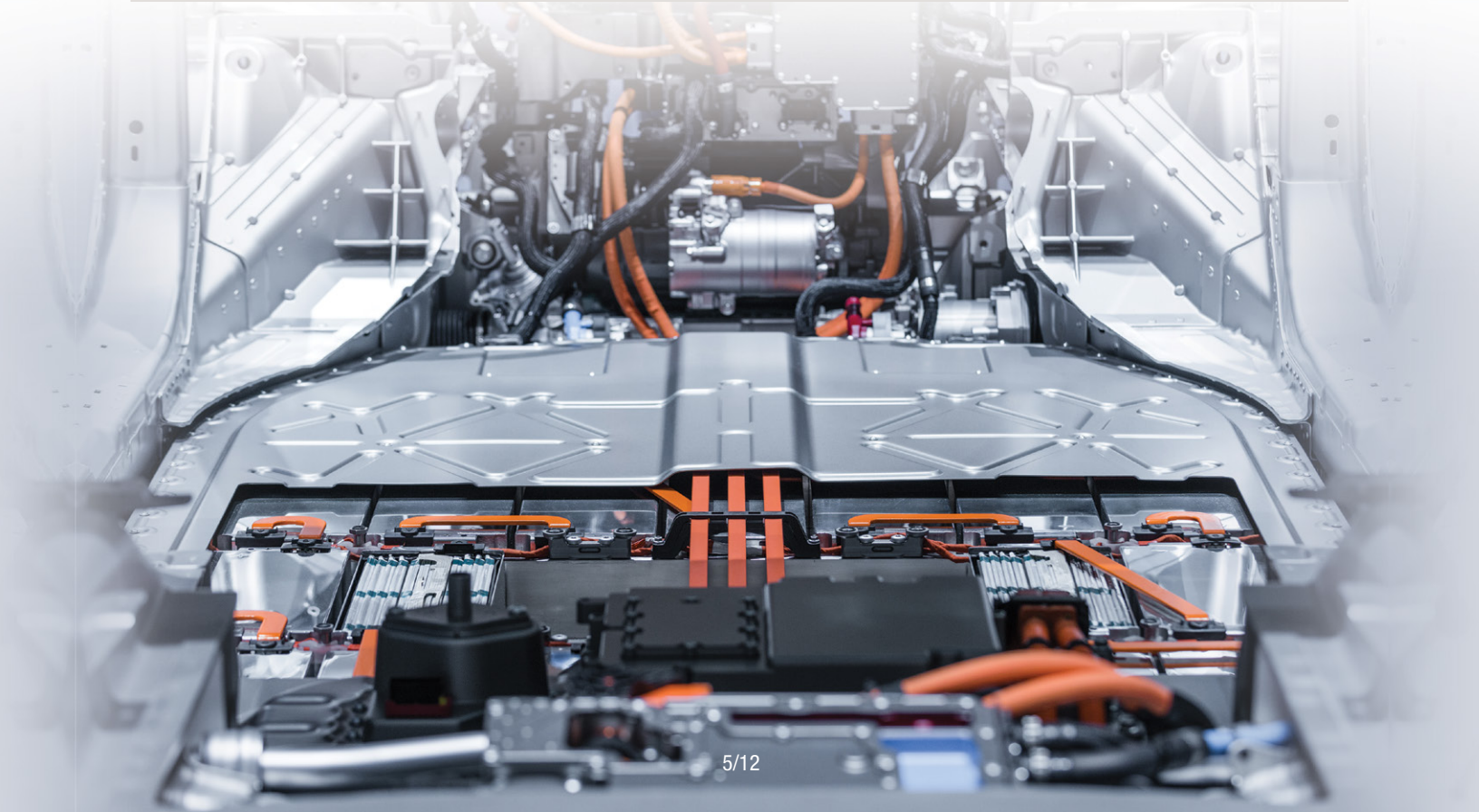


Wire compacting



Hot crimping

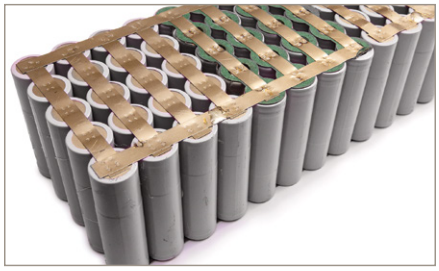
AMADA WELD TECH offers a range of equipment and systems for wire compacting applications of various sizes up to 90 mm^2. The exact products selected will depend on many things including the materials you are working with, the size/gauge of the wire to be compacted, the degree of compaction required, and your anticipated duty cycle.



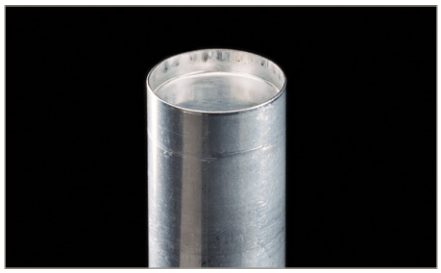
e-Mobility / Battery
The Road to Successful EV Manufacturing

As the number of electric vehicles and other transportation devices on the roads grows, so will the demand for high performance batteries to power them. The challenges encountered in bringing EVs to market include the demand for reduced weight, expanded range, faster charge times and lower costs. Translated into manufacturing goals, the batteries need to possess higher capacity with negligible energy loss delivering to the drivetrain, higher current carrying capacity for charging, and be made of light-weight, lower cost materials. Since the e-mobility market is so rapidly expanding, there are additional manufacturing challenges, including the demand for higher throughput and quality. Some of these goals can be achieved by improved cell chemistries and battery pack design, but others can be improved only by considering the joint quality between the batteries and the current collectors. That's where AMADA WELD TECH comes in!

Battery Tabs • Tab to Terminal Welding • Battery Can Sealing • Electrode Cutting
Dissimilar Metal Joining • Battery Marking • Lead Acid Battery Welding
Hairpin Welding and Repair



Battery modules and packs



Battery and super-capacitor cans

Hairpins for electric motors

AMADA WELD TECH offers a range of welding technology solutions for battery manufacturing including resistance welding, laser welding and micro TIG welding. Related applications are addressed with laser marking and laser cutting. The right solution for your specific application will depend on factors like materials, part accessibility and desired throughput.

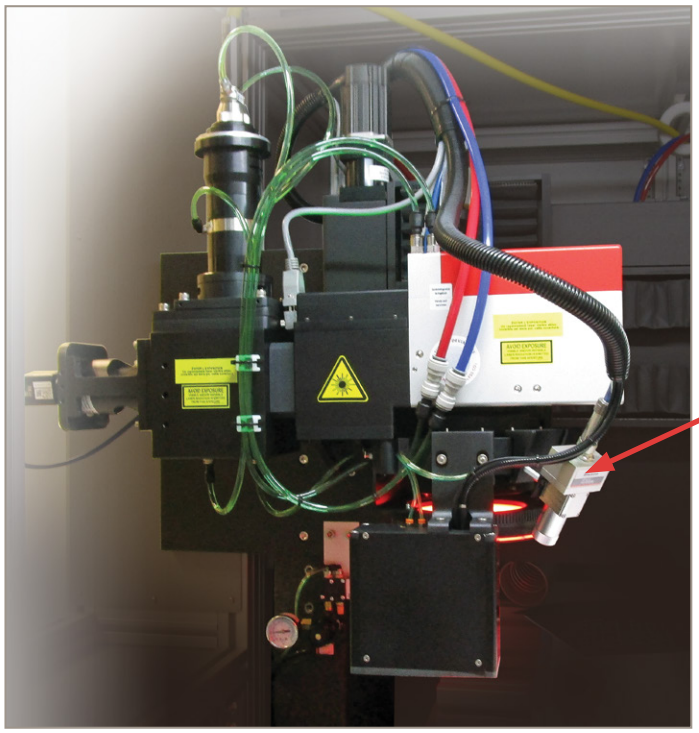
Ensuring Manufacturing Success with Process Monitoring

Product failure. Upset customers. Product on stop shipment. For the process manufacturing engineer, it's a worst-case scenario. When this situation occurs, it requires swift attention and accurate resolution: do you know the fundamental underlying issue? Can you calmly and expertly identify the source of the problem and what to do to get back on track? This is where process monitoring comes in. By observing and measuring the process, it is possible to discern good from bad product and, when bad occurs, specify defect signatures. In fact, process monitoring can help manufacturers avoid this situation altogether.

For laser welding, detect and record thermal signals and set an envelope (min/max) to determine good and bad welds by identifying errors such as gaps between parts, missing parts, over-penetration, incorrect focus, and cover gas absence. For resistance welding, monitor parameters like weld current, voltage drop across the electrodes, workpiece expansion and deformation, electrode force, electrode movement (displacement) and more.

The monitor data can also be used to develop better manual or automated workstations that can avoid weld inconsistencies. Plus, data collected with monitors can provide value *after* a product is sold in case of a recall or similar situation, as weld data can be correlated with serial numbers.

Improve Quality • Reduce Downtime • Reduce Scrap

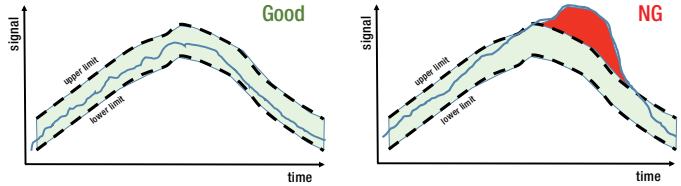


Laser weld monitoring

AMADA WELD TECH offers real-time process monitors for **laser welding, resistance welding, micro TIG welding and hot bar reflow soldering.** These stand-alone monitors are invaluable tools for product development, improving quality and throughput in production, and storing data for traceability.

Off-axis laser weld monitor

Portable resistance weld monitor with a touchscreen interface



Graphical representation of an instantaneous judgement of measured waveform versus limits that were determined during a DOE. The Good signal results when the newly measured waveform falls within acceptable values. The NG occurs when the waveform falls outside those limits.

Innovative Products for Manufacturing

Since 1948, AMADA WELD TECH has worked to achieve one goal: to solve customers' manufacturing challenges. Knowing there is no one solution that fits all, we strive to provide customers with innovative and reliable manufacturing technology solutions in an effort to be their single source provider.

At the heart of every system we build is one or more of our industry-leading products for advanced manufacturing. The technology selected will depend on your specific application and factors like materials, part accessibility and desired throughput. AMADA WELD TECH has expertise in a number of core technologies ensuring you get the right product for your application, floorspace, and budget.

Core Technologies

Resistance Welding
- High frequency DC power supplies
- Mid frequency DC power supplies
- Linear DC power supplies
- Capacitive discharge power supplies
- Alternating current power supplies
- Motorized electromagnetic weld heads
- Motorized servo weld heads
- Pneumatic weld heads
- Manual weld heads
- Resistance weld process monitors

Laser Welding
- Fiber lasers
- Nd:YAG lasers
- Blue diode lasers
- Laser weld process monitors

Laser Marking
- Fiber lasers
- UV nanosecond lasers
- Picosecond lasers

Laser Cutting
- Femtosecond lasers
- Fiber lasers

Laser Micro Machining
- Femtosecond lasers
- Picosecond lasers
- UV nanosecond lasers
- IR fiber lasers

Laser Soldering
- Direct diode lasers

Hot Bar Reflow Soldering
- Power supplies
- Hot bar reflow soldering heads
- Hot bar reflow soldering process monitors

Hermetic Sealing
- Projection welders
- Parallel seam sealers
- Gloveboxes

Micro TIG Welding
- Power supplies
- Torches
- Micro TIG weld process monitors

Our Philosophy: Define - Design - Deliver

Developing a unique solution geared for advanced manufacturing is complicated. Our approach? Define-Design-Deliver. This methodology helps us design the ideal system to meet your manufacturing needs and budget while maximizing your equipment ROI and meeting your production goals.

Process Assessment

- Determine part usage and success
- Optimize part designs
- Select material

Sample Qualification

- Process sample parts
- Determine optimal production settings

Equipment Specification

- Meets production, quality, and budget criteria
- Product flow
- Customer requirements

Product Assembly

- Engineer oversees project
- Work with customer & technicians

Test and Verification

- Rigorous testing
- System acceptance
- Customer directed

Installation and Support

- Install system and verify functionality
- Train engineers and operators
- Provide continual, ongoing support

Value Added Services

Training

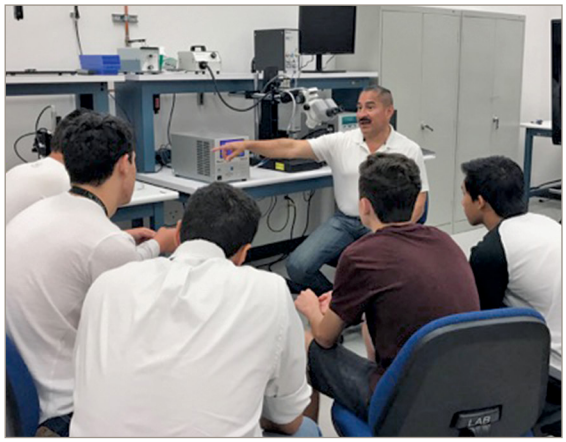
We offer application support and process development services at our Technical Centers in Monrovia, California; Wixom, Michigan; High Point, North Carolina, or on-site at your facility. These services can be tailored to meet your specific needs and may include hands-on equipment training.

Topics

- Technology fundamentals
- Developing process success
- Equipment troubleshooting

Location Options

- On-demand webinars
- Live webinars with Q&A
- Factory hands-on
- On-site training (specific to your equipment)



Around the Clock Service Support to Minimize Downtime

Inevitably something may go wrong. This can be caused by a multitude of reasons, but ultimately the longer that the product is out of order, the larger the impact to your business.

We are there when you need us.

24/7 Field Service

- **+1-866-751-7378**
- **service@amadaweldtech.com**

Our Resources, Your Success

Understanding the product and the process - ensuring success! Not sure your application is feasible? Want to know which technology is best suited to your process? Does your existing process require some modification or re-optimization? Our experienced team of Application Engineers are ready to provide assistance!

Technical Centers

- Western Technical Center - Monrovia,CA
- Midwest Technical Center - Wixom, MI
- Eastern Technical Center - High Point, NC

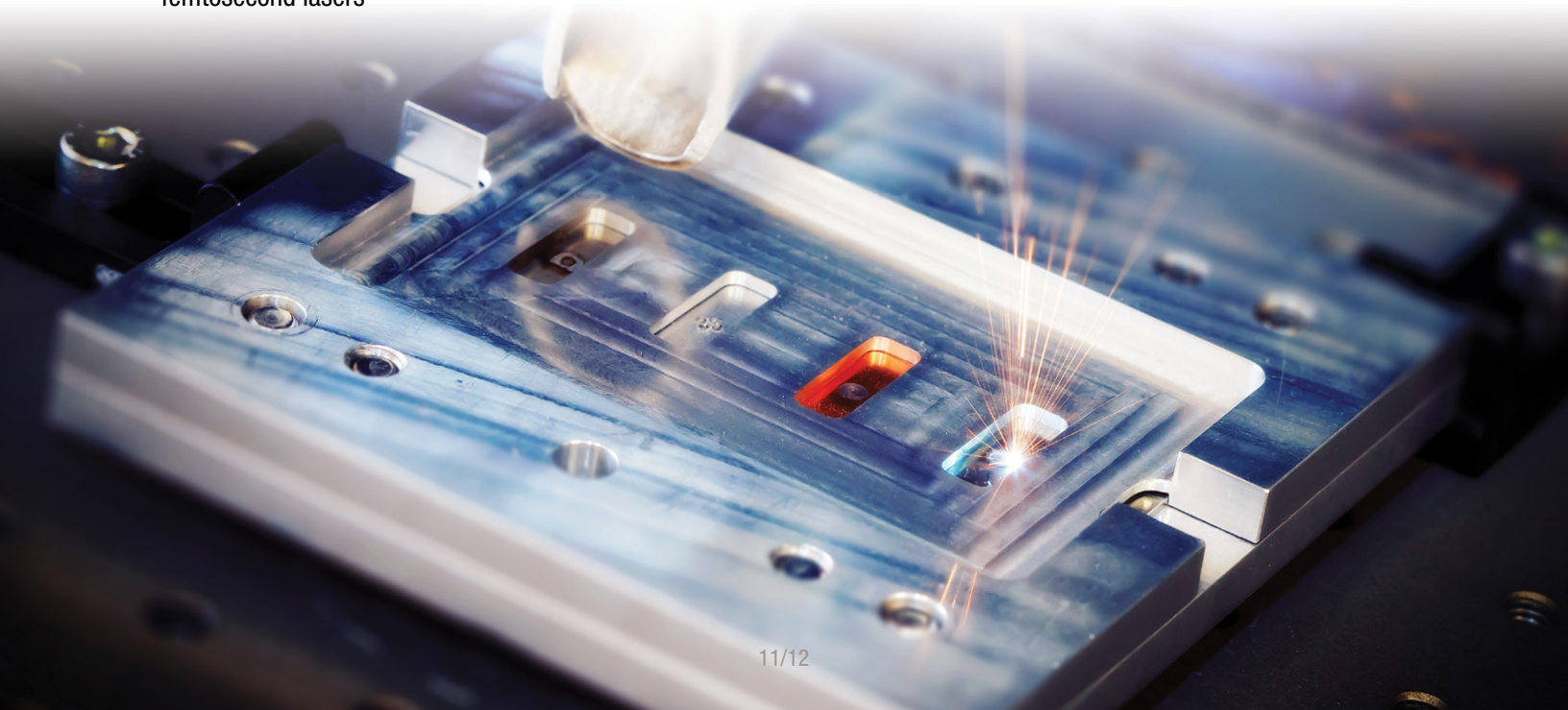
Experienced Application and Process Engineers

- 12 full-time application engineers and technicians

Dedicated Development Resources

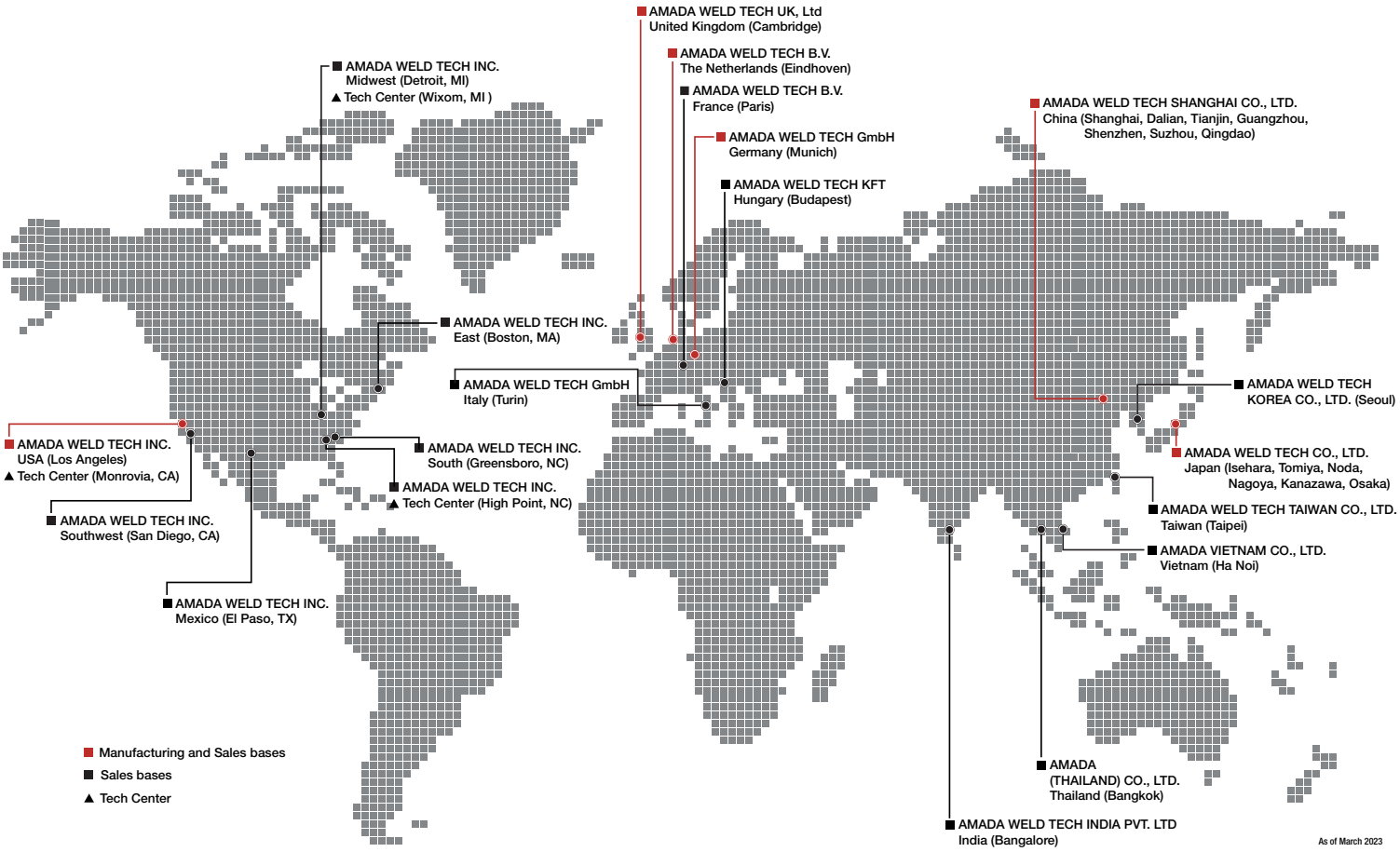
- **Core Technologies -** Laser welding, resistance welding, laser marking, laser micro machining, laser tube cutting, micro TIG welding, reflow aoldering, hermetic seam sealing
- **Facilities -** 10 state-of-the-art application labs for all core technologies
- **Range of Lasers -** CW, QCW and dual beam fiber lasers, diode-pumped solid-state (DPSS) lasers, Nd:YAG lasers, picosecond lasers and femtosecond lasers
- **Range of Beam Delivery Options -** Fixed, 2D and 3D galvo-scanning, wobble head, trepanning head, multi-axis taper-free cutting head
- **Range of Resistance Welding Power Supplies -** Linear DC, High Frequency, Cap Discharge, and AC Resistance Spot Welding Controls (5 A – 100,000 A)
- **4 and 5 Axis Laser Welding and Laser Micromachining Workstations**
- **Gloveboxes for Processing in an Inert Atmosphere**

Western Technical Center



AMADA WELD TECH

Your Global Partner



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