

# ADDRESSING CRITICAL CHALLENGES IN VEHICLE ELECTRIFICATION

**EWI**<sup>®</sup>  
*We Manufacture Innovation*



# A NEW DIRECTION IN THE AUTOMOTIVE INDUSTRY

The market for electric vehicles (EVs) and hybrid electric vehicles (HEVs) is growing at an unprecedented pace. The need to accelerate production is pushing the introduction of newer, lighter materials, and the redesign of batteries, cable and wire harness systems, and motors—all of which creates a new set of challenges for OEMs and suppliers.

By 2022, EVs are predicted to cost the same as their internal-combustion counterparts.



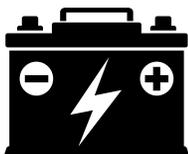
Today, about 2 million EVs are in use globally. 20 million are predicted to be on the road by 2020.



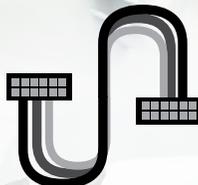
EV/HEV sales are expected to reach \$16.5 billion by 2025.



# TODAY'S VEHICLE ELECTRIFICATION CHALLENGES



- 1** Inspecting every connection for absolute assurance in a complex system with more joints than traditional batteries
- 2** Applying robust solid-state welding methods within an intricate, higher current connection system
- 3** Providing cooling and structural protection for battery boxes while fitting into elaborate architecture



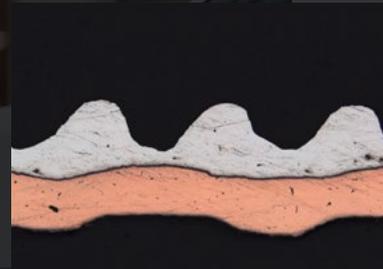
- 1** Developing monitoring systems to ensure fail-safe wire harnessing that supports brake-by-wire and drive-by-wire capabilities
- 2** Meeting fluctuating material, joint configuration, and strand count specifications
- 3** Replacing traditional crimp connections with welds as required for higher current terminal connections



- 1** Reducing design and production costs enough to make high-volume production viable
- 2** Improving the power-to-weight ratio of electric motors need to significantly reducing system weight designs
- 3** Managing and eventually streamlining the diversity of motor designs

# FINDING THE RIGHT EXPERTISE

**The complexities of vehicle electrification require advanced approaches to welding and joining, material selection and validation, control technologies, and quality testing. Where can your development team get help to meet the rapidly shifting requirements of vehicle electrification?**



# SOURCING ADVANCED ENGINEERING SOLUTIONS



## **EWI Can Help**

The advanced technology team at EWI has more than 30 years of experience working with the automotive industry to meet consumer demands, safety standards, environmental regulations, and innovation goals.

Our engineering specialists bring deep technical knowledge, manufacturing process expertise, and a sharp focus on applied development to meet the challenges of vehicle electrification today.

# What EWI brings to the challenge



## Batteries

- Solid-state joining solutions for tab-to-tab connections
- Inspection technologies to provide assurance that every joint is reliable
- Full range of joining technologies to address complex battery packaging systems

## Motors

- Ability to develop customized solutions that efficiently take clients from feasibility to demonstration through adoption
- Access to numerous joining techniques that can reduce system weight by replacing castings with fabricated structures
- Drivetrain –
- Solid-state joining options for reducing system weight by developing solid state joining technologies to couple motors to the drivetrain

## Cables/Wire Harnesses

- Advanced welding capabilities for secure terminal connections that eliminate traditional crimp-on connectors
- Decades of experience in developing ultrasonic weld solutions for complex wire systems
- Proven expertise in both wire consolidation and wire-to-terminal joining

# EWI—AN EXTENSION OF YOUR ENGINEERING TEAM

What is your key challenge in vehicle electrification?  
Contact EWI today to explore the best options and  
find the right solution for your application,  
[info@ewi.org](mailto:info@ewi.org) or **614.688.5152**.

EWI provides comprehensive engineering services  
to help companies identify, develop, and implement  
the best options for their specific applications. With  
unmatched expertise, state-of-the-art lab facilities,  
and technology resources, we offer customized  
solutions that deliver game-changing results.

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