



ELECTRIFICATION BEYOND MEASURE.

Solutions for Electrification
Development and Testing



EMISSIONS



ELECTRIFICATION



CAV



DATA

HORIBA
Automotive

Moving towards a cleaner and more sustainable mobility, the rise of electrified vehicles was predestined. Nowadays, a wide range of electrified options are available, ranging from plug-in to full hybrids and from battery electric vehicles to fuel cell powered ones.

Manufacturers are increasingly facing complex challenges in creating alternative battery and fuel cell based powertrain technologies. These challenges lead to a further increase in necessary testing procedures to ensure the efficient and safe integration of all components into the full vehicle.

At HORIBA we are combining decades of expertise in a broad range of industry fields, to offer our customers support for every step of the vehicle development and evaluation process. Our solutions range from the characterization on the material level to testing batteries and fuel cells, the electrified powertrain, and the full vehicle. Solutions cover different vehicle types (light- and heavy-duty as well as off-road/non-road mobile machinery) and different testing scenarios, in the laboratory and on the road.

To seamlessly integrate the diverse equipment into one flexible but reliable solution, HORIBA also offers a comprehensive set of test automation and lab and data management tools.

SYSTEM LEVEL

The rapid advancement of electrified vehicles requires increasingly adaptable testing solutions. From combining components of the internal combustion engine (ICE) with additional electric components to create different hybrid vehicle architectures (full hybrid, plug-in hybrid) to developing Completely electric options, which are either battery or fuel cell powered, the powertrain is constantly evolving. Our system test stands (for powertrain, e-motor, battery and fuel cell system testing) are characterized by their modular structure, which allows for high adaptability when testing different powertrain concepts.

COMPONENT LEVEL

At HORIBA, we offer reliable test solutions that support the development, qualification, and validation of fuel cells and batteries, as well as peripheral components or on-board power supply components. Combined with our high-performance automation software, highly dynamic driving cycles can be displayed, endurance runs can be realized in an automated way or characteristics of systems can be created. Furthermore, We also offer extensive solutions for quality assurance within production, ranging from manual up to mass production for batteries and fuel cells.

HORIBA Electrifies

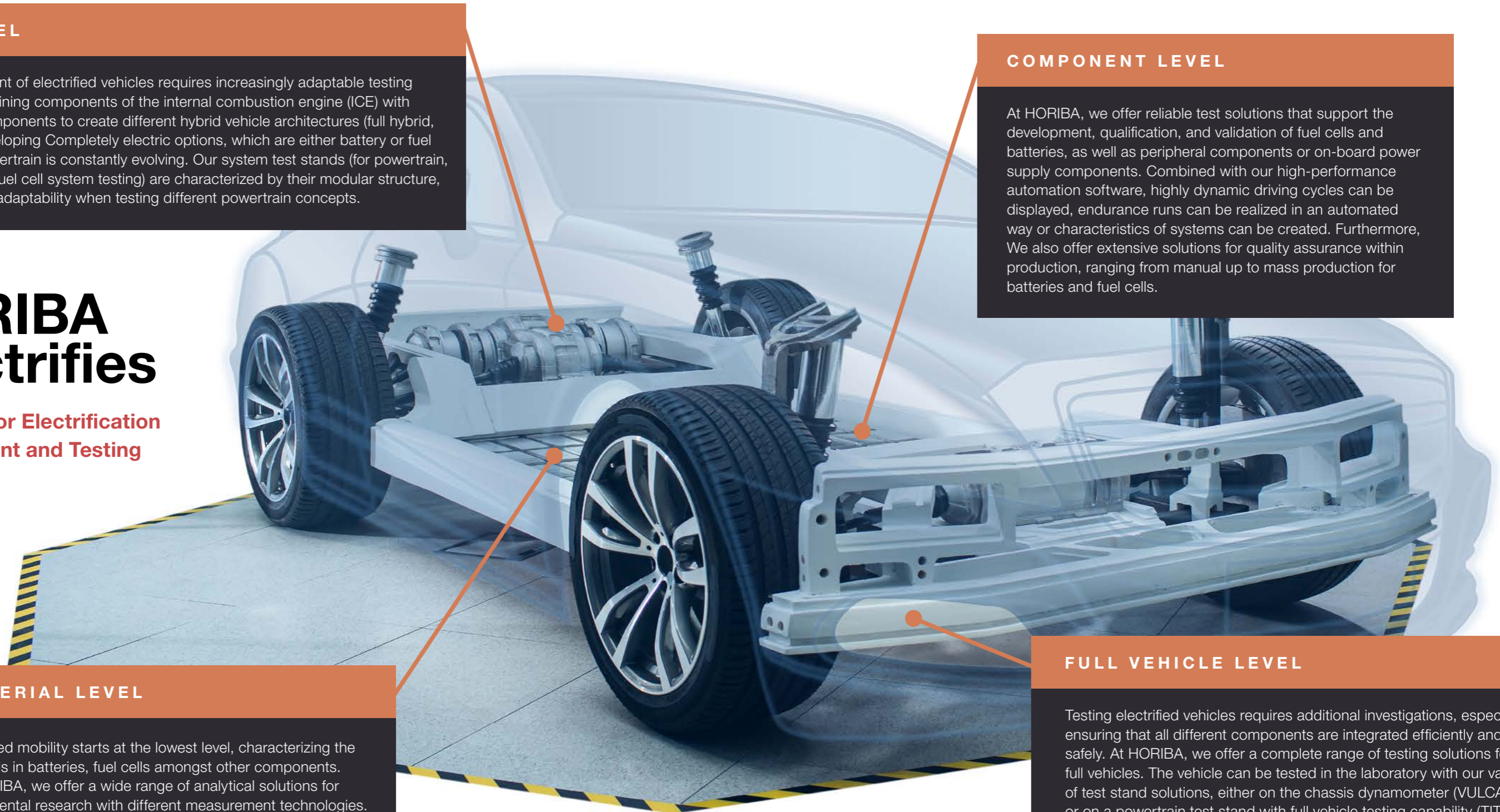
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MATERIAL LEVEL

Electrified mobility starts at the lowest level, characterizing the materials in batteries, fuel cells amongst other components. At HORIBA, we offer a wide range of analytical solutions for fundamental research with different measurement technologies. Based on the results of this research, further development eventually leads to fully functional battery or fuel cell systems which enable an electrified powertrain. HORIBA's non-destructive sampling and analysis methods for particular research tasks offers a more cost-efficient and safer testing option, e.g. in battery research.

FULL VEHICLE LEVEL

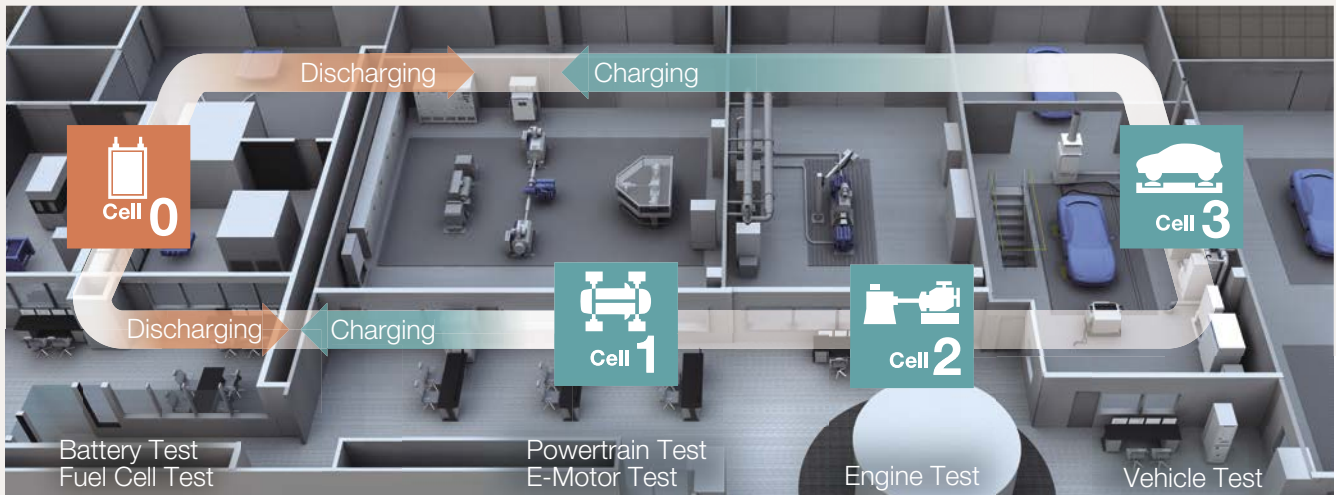
Testing electrified vehicles requires additional investigations, especially ensuring that all different components are integrated efficiently and safely. At HORIBA, we offer a complete range of testing solutions for full vehicles. The vehicle can be tested in the laboratory with our variety of test stand solutions, either on the chassis dynamometer (VULCAN) or on a powertrain test stand with full vehicle testing capability (TITAN Powertrain). Both options offer the simulation of realistic driving profiles by reproducing real road data. Additionally, vehicles can also be tested on a proving ground under real-world conditions.



HORIBA's Approach to Innovation for Future Mobility.

HORIBA offers a "Test in the Loop" solution to optimize electric vehicle development and certification. This process supports the industry in responding to the increasing complexity of electrified vehicles and the man-hours needed to complete development without a streamlined process.

"Test in the Loop" enables connection of the full vehicle, battery, fuel cell, motor, powertrain and engine without the real specimen or models. We then are able to evaluate each cell to simulate the real-driving environment. By simulating the real-driving environment, we can accurately evaluate the sub-systems and the vehicle for performance verification and optimize the full system in the development and design phases.



COMPLETE

- Full range of solutions for electrified vehicle R&D, production and quality assurance
- Solutions from material characterization to component, system, and full vehicle testing
- Solutions for testing in the laboratory and on the road

UNIQUE

- Complete solution, delivered by HORIBA specialists
- Decades of in-house technology and application expertise across different industries
- Extensive support across the R&D chain, including engineering, residential support, service and turnkey

EXPERIENCED

- 75 years of experience in highly precise measurement and testing technologies
- Over 20 years of experience in EV technologies
- Deep market insight due to global installed base

HORIBA Automotive, a business segment within the HORIBA Group, provides advanced mobility leadership and comprehensive engineering and measurement expertise to support the gradual shift from traditional propulsion, to fully electrified solutions.

horiba.com/automotive

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