

# EV Battery Testing and Homologation

Battery pack testing and homologation services for compliance with the UN DOT 38.3 standard (Battery Transportation), ECE R100 and R136 regulations (Battery Safety), ECE R10 regulation (EMC on BMS), and OEM standards.



Lithium Batteries are one of the most differential components in battery electric, hybrid electric, plug-in hybrid electric and fuel cell electric vehicles (BEV, HEV/PHEV and FCEV). Due to safety hazards, batteries must comply with strict test standards to ensure they will continue to resist all the environmental factors they will face throughout their life cycles (shipping, operations, crashes, etc.).

While some of these tests are performed at cell or module level (e.g. altitude), others must also be carried out at battery pack level, which requires specialist test equipment in terms of size and safety measures.

## Comprehensive battery testing capabilities

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Through our network of testing facilities in Europe, we are able to provide a one-stop service for battery testing and homologation. Our lab in Silverstone (UK) has a dedicated test centre for batteries equipped with state-of-the-art equipment to test vibrations, climatics, cycling and emc testing on battery packs and BMS. Our test centers in Spain can manage the rest of tests required, everything from fire to mechanical shock.

## Vibration testing

Best-in-class test system for vibrations and shock combined with climatic conditions:

- 200 kN for random and sine vibrations testing
- 400 kN for shock testing
- Coupling with a large climatic chamber for batteries packs up to 2 m x 1.6 m

## Environmental and cycling testing

Our UK lab also boasts a wide range of equipment for environmental simulation, including:

- Thermal Shock (Dual climatic chamber)
- Climatic testing (from -70°C to 180°)
- Corrosion / Salt Spray
- Altitude
- Battery Cycling

## EMC testing

EMC testing on Battery Management Systems (BMS) can be done in the UK or in the rest of our labs in Europe and China.

- EMC on BMS as a stand-alone component, integrated in battery or at vehicle level

## Fire Safety testing facilities

Our fire laboratory in Barcelona (Spain) conducts **full-scale battery fire tests** at cell, module and pack level, conducted by expert fire engineers.

- Thermal Runaway
- Fire Resistance

## Mechanical shock testing facilities

In Applus+ IDIADA's facilities in Tarragona (Spain), we have a specific center for battery testing and development with capabilities for:

- Mechanical Shock
- Mechanical Integrity
- Battery Abuse

## EV battery standards and regulations

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We provide a complete testing and homologation service for batteries following the main testing standards and regulations, including **OEM standards based on 19453-6:2020**. We work in collaboration with the rest of the Applus+ labs as well as our Technical Service, Applus+ IDIADA, to offer a veritable one-stop shop service.

### UN DOT 38.3

Battery Transportation

### ECE R100 (and R136)

Battery Safety Homologation

### ECE R10

EMC Homologation (BMS)

#### Testing

- T1 - Altitude simulation
- T2 - Thermal test
- T3 - Vibration
- T4 - Shock

#### Testing

- 9A - Vibration tests
- 9B - Thermal shock and cycling tests
- 9C - Mechanical shock
- 9D - Mechanical integrity
- 9E - Fire resistance
- 9F - External short circuit protection
- 9G - Overcharge protection

#### Testing

- Emission Radiated
- Immunity Radiated
- Emission Conducted
- Immunity Conducted

## UN DOT 38.3

### Battery Transportation

- T5 - External Short Circuit
- T6 - Impact/Crush
- T7 - Overcharge
- T8 - Forced Discharge

## ECE R100 (and R136)

### Battery Safety Homologation

- 9H - Over-discharge protection
- 9I - Over-temperature protection
- 9J - Over-current protection

### Homologation

Applus+ IDIADA  
Technical Service for ECE R100

## ECE R10

### EMC Homologation (BMS)

- Electrical Tests

### Homologation

Applus+ IDIADA  
Technical Service for  
ECE R10