

FACT SHEET THE DEKRA BATTERY TEST FOR ELECTRIC CARS

For electric vehicles (EVs), the battery capacity is fundamental to functionality and performance. It is also the most valuable component in an electric car, which makes its State of Health (SoH) a crucial factor in determining the used car's current value. But with time and usage of the battery, the available capacity is irreversibly decreasing due to various factors and then no longer corresponds to the original capacity of the battery in the new state. That's why being able to assess the battery's SoH i.e. the remaining capacity is so important when buying, selling or operating used electric cars.

Factors influencing the battery capacity

Battery age is not only a function of linear time (calendar age) but also of the cycle of charging and discharging (cyclical age). As the battery ages, its capacity gradually decreases, affecting the vehicle's range. Ageing of the traction battery of an electric car means deterioration of the battery's characteristics. As battery ages, its internal resistance increases. This can result in heating up of the battery in electric cars when they are charged or discharged.

Environmental conditions, such as temperature, but also charge/discharge current influence the battery's condition.

The DEKRA battery test for electric cars

The decreasing battery capacity can't be prevented. However, the current state of ageing can be determined based on its SoH, defined as the ratio between the capacity of the battery in the state new and the remaining capacity at the moment of test. Based on the SoH, an indication can be given about the vehicle's current performance and value.

Specifically for this purpose, our DEKRA electromobility experts have developed a quick and easy test designed to provide an independent SoH assessment of the the High Voltage (HV) batteries. Our test is already compatible with many manufacturers and models of Plug-in Hybrid Electric Vehicles (PHEVs) and Battery Electric Vehicles (BEVs), with more models in the works.



Current



Internal Resistance

Voltage

Boundary conditions

SoC, Temperature



Database & Classification

SoC, Temperature

State of Health

Internal Resistance calculation

SOH calculation

DEKRA Algorithm

The technology behind our test procedure

- ▶ In the static part of the test, battery related data such as current, voltage, cell temperature, cell voltage and State of Charge (SoC) are read from the battery management system of the vehicle.
- ▶ Next, in the dynamic test by applying a load in form of a short but even acceleration, the current and voltage values are recorded from which the battery's internal resistance is calculated.
- ▶ Taking the boundary conditions including temperature, SoC and battery type into account, internal resistance is then mapped to the State of Health.
- ▶ Classification of the test measurements using reference data is carried out.
- ▶ Finally, the test result with a possible maximum average error of +/- 2,5% (when performed under boundary conditions) is available.

Why DEKRA?

Our **battery test for electric cars** is the latest in a long tradition of forward-thinking services and innovations designed to meet the needs of the automotive industry. DEKRA's electromobility experts, acutely attuned to the sector's developments, anticipated the demand for an independent, easy-to-use battery test and quickly responded, developing a methodology for determining SoH. This methodology received a patent in May 2021. The efficacy of the

DEKRA battery test for electric cars has been officially validated by the RWTH Aachen as well as by various EV manufacturers. We are your trusted partner for electromobility today and in the future.

Get in touch with our electromobility experts to learn more about our battery test for electric cars.

[CONTACT US](#)