



Testing and certification
for **EV charging**
infrastructure

EV charging stations: powering e-mobility

Drivers of electric vehicles (EV) expect a seamless charging experience without interruptions. However, the e-mobility landscape includes a wide variety of electric vehicles and electric vehicle charging stations. This diversity can complicate the process of ensuring the correct communication between vehicles, charging stations, charge point operators, and the power grid.

It is important to understand the types of testing and certification needed to prove that your product is interoperable, safe, and secure, and delivers a seamless charging experience.

End-to-end testing: DEKRA's solution for the EV charging ecosystem

One of our unique capabilities is end-to-end testing of electric vehicle charging infrastructure, ensuring secure communication between the electric vehicle, the charging station, and the charge point operator (CPO).

End-to-end testing is the most comprehensive test of the EV charging ecosystem and includes evaluations of interoperability, conformance, electrical safety, wireless, electromagnetic compatibility (EMC), reliability, performance, and cybersecurity. In addition, we offer conformance services based on regional, national, and international standards and regulations.

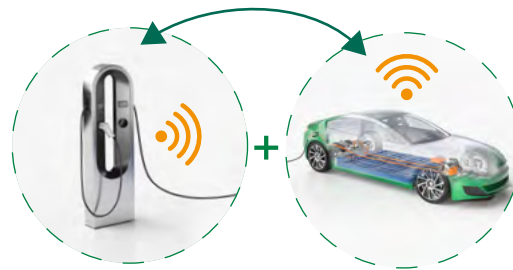
We test according to electric vehicle charging stations standards:

- ▶ IEC 61851-1
- ▶ IEC 61851-23 (DC)
- ▶ IEC 61851-24 (Com)
- ▶ IEC 61851-21-2 (EMC)
- ▶ IEC 62955 (RDC-DD)
- ▶ IEC 61439

End-to-end testing

Ensuring interoperability in EV mobility

EV charging station to vehicle



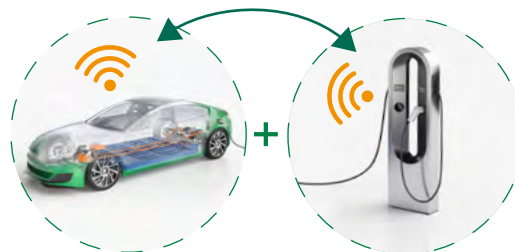
Smart charging testing

EV charging station to grid connection



Power quality testing

Vehicle to EV charging station



Charging reliability and performance testing



User experience



Cybersecurity testing



EMC and RF testing

What types of testing and certification are required and recommended for EV charging stations?

There are many EV charging stations on the market, offering variations in charging speed and current type. For example, AC chargers for home use, combined AC/DC chargers, and combined CHAdeMO and CCS chargers. The charging power of the stations also vary widely and can be as high as 350 kW.

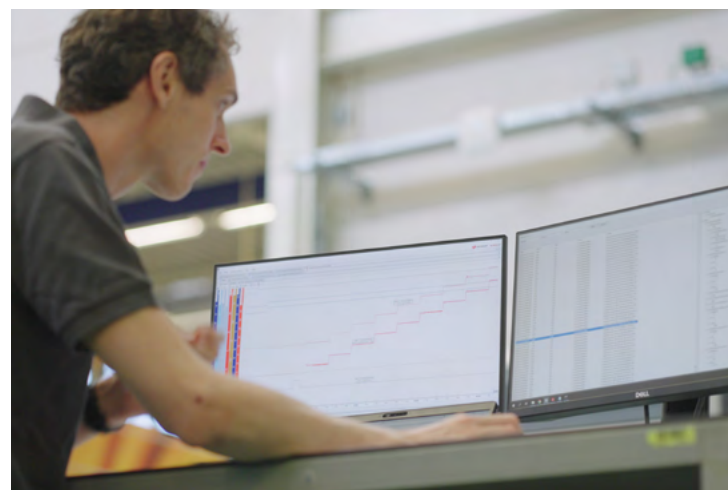
Different types of chargers require different testing and certification. At DEKRA, we offer the widest testing scope for EV supply equipment and our laboratory has the most complete accreditations and recognitions in the industry. In addition, we have testing laboratories in multiple locations, including the Netherlands, U.S., and China. This allows us to provide support around the world to ensure products are safe, secure, interoperable, and efficient.

Our testing scope

- ▶ AC (1- 43 kW)
- ▶ DC (up to 720 kW)
- ▶ CCS Type 1 AC Level 2 Up to 80A
- ▶ CCS Type 2 Up to 600A

Our accreditations & recognitions

- ▶ Dutch RvA accreditation
- ▶ IECEE recognized laboratory
- ▶ EV ready recognized laboratory
- ▶ CHAdeMO recognized laboratory
- ▶ OCA-OCPP recognized laboratory
- ▶ CharIN (CCS) recognized laboratory





DEKRA is one of the **first test laboratories** in the **world** recognized by **CharIN** for interoperability certification.

DEKRA can issue **EMC CB certificates** for **high-power DC chargers** up to up to **350 kW** and **AC chargers** up to **43 kW** 3 phase.

Our testing services



Product safety testing

- ▶ Charging performance testing
- ▶ Smart charging testing
- ▶ Charging reliability testing
- ▶ Power quality testing
- ▶ Interoperability testing
- ▶ Grid compliance testing
- ▶ Electrical safety testing



EMC and RF testing



Connectivity testing

- ▶ Functional safety testing
- ▶ Environmental testing
- ▶ Conformance testing
- ▶ Iso 15118
- ▶ Plug and charge iso 15118
- ▶ Din spec 70121
- ▶ Sae j1772



Cybersecurity testing

Product certification services

At DEKRA, we help you demonstrate that your products have been thoroughly tested and meet the necessary standards and requirements for markets around the world. We do this by offering you a range of marks and certifications through our global network of laboratories.



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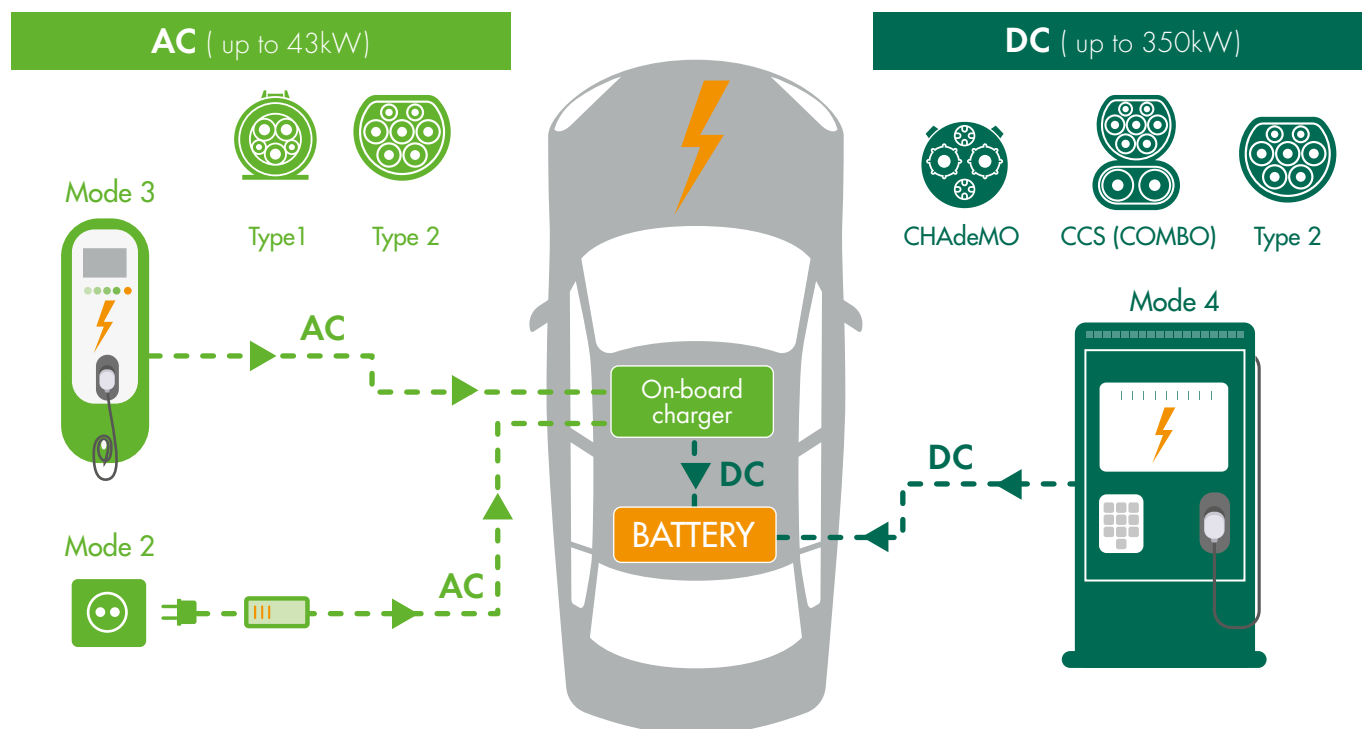
DEKRA Mark

The DEKRA Mark is a certification mark demonstrating that your product has been thoroughly tested and meets all required safety standards. It is a combination of type testing, factory inspections, and market surveillance. The mark is based on internationally accepted standards and it is your product's passport to a worldwide market access.

The DEKRA Mark demonstrates that your charging station is prepared for any market and proves that you care about your customers' safety.

EV cables and plugs testing

In the e-mobility ecosystem, there are different plugs and cables to charge electric vehicles, depending on the current type: alternating current (AC) or direct current (DC). At DEKRA, we test the following types of EV plugs and cables: **Mode 2, Mode 3, Type 1, Type 2, CHAdeMO and CCS**.



EV charging plugs and cables need to be tested in order to ensure they are safe and secure for consumer use and work correctly with any type of charging station. At DEKRA, we perform a range of tests on EV cables and plugs to ensure seamless operation.

Our testing services

Product safety testing:

- ▶ Electrical safety testing (EN/IEC 62196-1 and EN/IEC 62196-2)
- ▶ Mechanical testing (EN/IEC 62196-1 and EN/IEC 62196-2)
- ▶ Interoperability testing (CharIN)

DEKRA is one of the only organizations that can test liquid-cooled charging cables and connectors, which are used in high-power DC charging stations.



Why DEKRA for EV charging station testing and certification?

At DEKRA we offer you:

- ▶ The widest testing scope in the industry.
- ▶ The most comprehensive test laboratories with locations around the world.
- ▶ More than a decade of experience in e-mobility testing.
- ▶ End-to-end testing, a comprehensive solution that examines interoperability of the full EV charging ecosystem, from the car to the grid.
- ▶ The DEKRA Mark, an internationally accepted certification mark.
- ▶ Flexible testing solutions conducted in our labs or in those of the manufacturer.
- ▶ The unique capability to issue EMC CB certificates for high-power DC chargers up to 350 kW and AC chargers up to 43 kW 3 phase.
- ▶ Liquid-cooled charging cable and connector testing.
- ▶ One of the first test laboratories in the world recognized by CharIN for interoperability certification.
- ▶ Testing for smart charging, power quality, charging reliability and performance, and user experience of EV charging stations.
- ▶ The most current knowledge of the industry as a member of standardization and industry groups.

