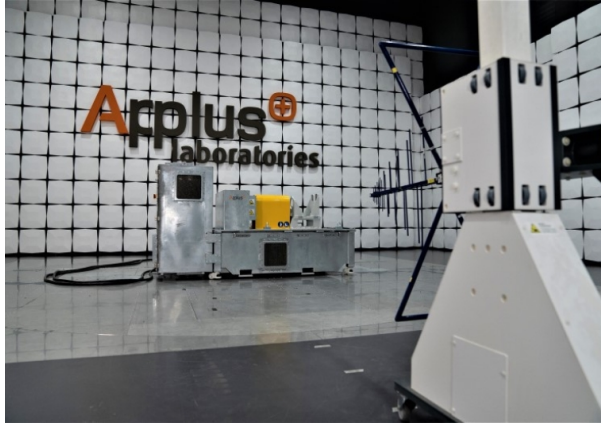


# Electric Motor Testing



## What Is Electric Motor Testing?

**E-motors** are at the core of **electromobility** and, alongside batteries, are the most critical components that determine the **performance and autonomy of [new energy vehicles](#)**. E-motors must be coupled with an inverter to form an **Electric Drives Unit (EDU)**.

These units can then be integrated into a larger system, the **e-Axle**, combining the electric motor, the power electronics, and the transmission, to provide a compact and **efficient solution** to power electric and hybrid vehicles.

## Why is Electric Motor Testing Necessary?

As a critical component of the vehicle, the e-motor must be tested to ensure its safety and reliability in usual and harsh conditions (climatic, vibrations and electric loads) and its effect in vehicle electronic system as a whole (EMC). Applus+ Laboratories is a specialist provider of e-Motors testing services.

## How Does EMC Testing on E-Motors Work?

The **electromagnetic compatibility** of the EV motor with the rest of the electronic systems is a key component of the vehicle's electric architecture. E-motors can be **tested under various configurations** each one simulating different operation conditions:

- EDU in static configuration: idle / rotor locked
- EDU under dynamic configurations:
  - Driving mode
  - Regeneration or braking mode

All our EMC labs are equipped to test e-motors in **static and back-to-back configurations**, with dedicated high-voltage power supplies, cooling systems, as well as communications tools available (INCA, Vector CANoe, and LabView).

## EMC testing of E-Motors in Motion

In order to test the electric motor, EDU or e-Axle, in motion (driving mode), a special dynamometer is required to simulate realistic operation conditions of speed and torque.

We have different solutions for testing electric drives in motion at our laboratories in Europe and China.

- **Mobile Dyno:** Located in our UK lab in Silverstone, this portable test bench of 140 kW can be set up on the **turntable of our 10m measurement semi-anechoic chamber**. While the e-motor and the EMC-silent dyno spin, we can take EMC measurements at 360 degrees. The dyno was developed in-house by our engineering team.
- **Fixed Dyno:** Located in our Shanghai Lab, a **fixed dyno of 220 kW** placed outside the semi-anechoic chamber, connects through a shaft with the e-motor.

**Both systems are bi-directional**, which allows it to simulate different driving mode configurations, including road simulation and regenerative braking mode.

## Environmental, Vibration and Electric Testing on E-Motors

E-Motors and EDUs are exposed to **different conditions during their service life** that can affect their performance and durability. In our laboratories we are able to simulate vibration loads from **shocks, [random and sinusoidal vibrations](#)**, combined with **[harsh environmental conditions and electrical loads](#)**.

Between the tests, extensive parameter tests consisting of leakage tests, electrical tests, NDT and detailed evaluation of all relevant CAN protocols are carried out.

## Why Choose Applus+ Laboratories for Electric Motor Testing

Choosing [Applus+ Laboratories](#) for your e-motor testing means partnering with a **leader in automotive testing solutions**. Our comprehensive range of testing capabilities, combined with our **commitment to client service**, makes us the ideal partner for all your e-motor testing needs.

Applus+ Laboratories aims to be a **one-stop shop for e-motor testing**, offering a full range of services to support your product development and accelerate your time to market. We offer:



- Advanced test bench solutions for real-world motor simulation
- Environmental and vibration testing for complete durability assessments
- Product qualification and performance testing

With a presence in **key locations worldwide**, we deliver our testing services globally, ensuring you have access to the best in e-motor testing no matter where your project is based.