ENORISE
Simulate, Automate, Qualify

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ENORISE
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Proven and flexible solutions for e-Mobility tesing

E-motor & E-axle testing

E-drive

Benefits from more than 4 decades of experience in the design and realization of test benches

E-motor and E-axle

An e-axle bench, allows to test the whole traction chain. Its maximum speed oscillates around 3000 rpm, with torque around 2800 Nm for standard e-axle test cell. The bench is adaptable to many types of architectures. The high programming flexibility of MORPHEE®, the ENORISE automation software, allows specific tests to be carried out, for example to define the control laws of the EMS (Energy Management System). Our Battery simulator BatteryCraft supplies power to e-Motor inverter in highly dynamic way and with regenerative DC voltage source.

ENORISE also offers standard e-motor test benches, used to characterize the electric motor. The key aspect of this type of test bench is its ability to test at very high speeds and in a highly-dynamic process. Vibrations are taken into consideration. ENORISE produces state of-the-art e-motor test benches, including ENORISE dynamometers. It offers e-motor test bench solutions enabling rotational speeds of 24,000 rpm and above. The MORPHEE® application used to control the bench can control PID speed and torque control loop through a GUI interface with full of possibilties, and allows a very easy connection to the EMSs (Energy Management System). Power measurement is also available with ENORISE powermeter to provide expected and accurate results files.

Validation of the complete driveline

E-axle test benches

In this configuration, this is not only the e-motor that is tested but the complete drive chain. It permits, in the downstream steps of the development, to test the complete system. The calibration of the inverter is done, with the goal to increase the global efficiency of the system. Power analysis is required.

ENORISE operates, plans and implements state of-the-art e-axle test beds. This involves the use of ENORISE dynamometers and conditioning systems, as well as tailor-made solutions for customer-specific requirements. Here again, the MORPHEE® automation system offers a high degree of flexibility and simple configuration for various e-axle test beds types.

„3000 rpm, with 2800 Nm*“

Key benefits of ENORISE e-mobility test benches

- State-of-the-art solutions
- Solutions based on robust and validated products
- Flexibility and scalability of MORPHEE®: A test bed that follows changes in technologies
- OSIRIS® Powermeter: the most accurate measurement in transport field
- eCoolCon
- BatteryCraft
- M.I.O Acquisition modules

**and above according to customer requirements*

E-motor characterization

High-speed e-Motor test benches

E-motor testing aims to characterize the e-motor and the inverter, in the upstream steps of development. This requires to be as close as possible from the real conditions, such as the climatic ones – in that case, a climatic chamber is used – or the driving in itself – models simulating the driver, the road.... The key factor considering this type of test bed is its ability to test at very high speeds and highly dynamically. Vibrations are to be considered.

ENORISE designs and industrialize e-motor test beds. ENORISE dynamometers and ENORISE conditioning systems are part of the solution, as well as tailor-made solutions for customer-specific requirements.
The MORPHEE® automation system offers a high degree of flexibility and simple configuration for various test beds types. At present, ENORISE has built e-motor test bed solutions that enable rotational speeds of 24,000 rpm and above.

Dynamic E-Motor test bench of 24 000 rpm and above: good accuracy for speed control for low speed (0...10 rpm)

Characteristics of ENORISE e-Mobility test benches

- MORPHEE® for e-mobility (Automation, Simulation and Calibration)
- Preferred models for electric drive chains
- Various architectures evaluated
- EtherCAT
- ECoolCon for Water and oil conditioning with 1...3 circuits, with automatic fill and drain
- OSIRIS® powermeter
- Battery simulator
- Climatic chamber