Cetim's services

DESIGN AND VALIDATION OF POWERTRAINS AND PERIPHERALS FOR ELECTRIC VEHICLES

Mechanical, hybrid and electric powertrains: high speed/high power tests, thermal system tests and development of hydrogen tanks

Your expectations

In order to reduce the CO2 emissions of your vehicles, you need to:

- Validate your mechanical / hybrid / electric power trains or their components
- Design and validate hydrogen storage systems and tanks
- Carry out multiphysics tests to validate the thermal systems of your vehicles

Our solutions

As a long-standing testing partner for the automotive industry, Cetim has has been carrying out tests on complete power trains or some of their components for more than 15 years. Today, these tests and analyses performed on gearboxes and differentials are now supplemented by tests on high speed gear reducers, rotors, thermal heating systems and, more generally, with multiphysical tests under power electronics load. Our experts also provide their know-how regarding the efficiency measurement and improvement.

Thus, Cetim has contributed to reducing carbon emissions for several years through:

- Its range of high power / high speed tests (high speed spindle: 250 kW, 20,000 rpm, and adjustable battery simulators up to 250 kW)

48V hybrid gearbox tests
High speed gear reducer tests: bearing / pitting / power axle failure
Gear motor tests
- Its range of combined tests involving several stresses (e.g. climatic, vibratory and electrical environments), including specimen instrumentation and associated parameter acquisition systems.

HV electrical testing up to 1500 V
- Its full support in the design, validation and industrialisation of hydrogen storage systems in thermoplastic composites, incorporating integration of a “Life Cycle Analysis / Circular Economy” approach

- Analysis and advice on particulate cleanliness of H2 components and tanks.

ZOOM ON HYDROGEN

HyMEET, our technological platform dedicated to H2, provides mechanical engineering with resources and skills needed to master low-carbon hydrogen production, distribution, storage and utilization technologies. HyMEET

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combines an ambitious R&D program with a €25 million investment in resources dedicated to characterization and validation tests (up to 1000 bar and in a range of temperatures from deep cryogenics to high temperatures) as well as consulting and training.

Its activities are dedicated to:

Characterizing the behavior of materials in contact with hydrogen
Development of specific test methods
Characterization of specific mechanical equipment and systems in severe hydrogen environments.
Our equipment enables:

Mechanical characterization of materials using fatigue machines in a high-pressure hydrogen environment
Control of sealing systems and plant containment, with test benches developed to study gas diffusion phenomena, resistance to rapid decompression and sealing performance under severe conditions
The study of the ageing of test specimens in high-pressure autoclaves
Tests under cryogenic conditions for the use of hydrogen in liquid form, with several cryostats fed by a helium-hydrogen liquefier
Multiphysics tests with pressure, temperature and .... cycling.
Manufacture of thermoplastic composite parts (tanks, tubes) by in-situ deposition and consolidation (in real time, with no further steps required) using our HySPIDE TP robotized cell.

Your benefits

A wide range of applications: from electric scooters to helicopters, including cars, buses, trucks, etc.

A player able to carry out the full range of powertrain tests.

Your tests are carried out on modular platforms dedicated to testing of electric motors.

More than 15 years of expertise in the development of composite parts.

Reduced validation times thanks to a “simulation / tests correlation” approach.

A dedicated contact person for a whole project.

Burst pits suited to hydrogen tanks, enabling validation of the new thermoplastic H2 tanks.

More than 50 years of expertise in mechanical and automotive engineering.

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