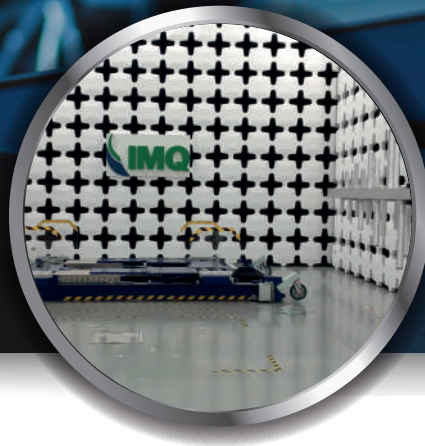
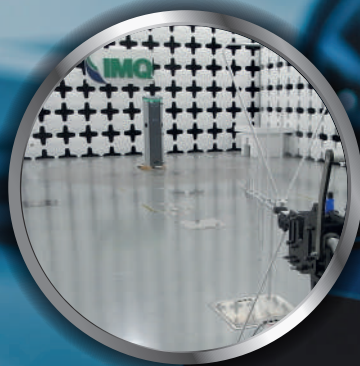


The HI-TECH HUB for **TESTING** e-Mobility





CSI, through its Automotive BU, is active in the field of development, testing and homologation of automotive batteries for electrified powertrains, operating in compliance with the quality standard **ISO/IEC 17025**.

The range of services offered for the development of battery systems, together with complementary services in the field of electric and hybrid vehicles, and engineering, allow CSI to offer a **complete service: from concept to full vehicle validation and certification/type approval**.

BATTERY SYSTEMS

Validation & Homologations

Test Standard

Tests are performed in accordance with the main European and extra-European regulatory standards such as:

- » UNECE R100 "Uniform provisions concerning the approval of vehicles with regard to specific requirements for the electric power train"
- » UNECE R10 "Uniform provisions concerning the approval of vehicles with regard to electromagnetic compatibility"
- » UN 38.3 "UN Recommendations on the Transport of Dangerous Goods"
- » KMVSS Part 48. "Safety Test for Traction battery"
- » GB 31467.3 "Lithium-ion traction battery pack and system for electric vehicles Part 3: Safety requirements and test methods"

Testing facilities

Up to
500 kW

Charging/discharging power supplies:
0 ÷ 1200 V d.c. / 0 ÷ 1000 A

Up to **147**

Testing channels

No. **13**

Climatic chambers (0.3 ÷ 220 m³) operating in -60 ÷ +220 °C temperature range

No. **5**

Vibrating benches up to 700 kg of payload

Up to **50g**

Acceleration sled for shock tests

Available services

Full homogation

According to ECE R100, ECE R10 and GB 31467.3, ECE 155/156 under accreditation

Testing for self-certification

According to UN 38.3 and KMVSS Part 48

Complementary activities

- Full 3D scanning activity of battery components
- Integrity and functionality verification on post-crash battery

Other validation services

- Validation & durability on full vehicle & subsystems/components
- Benchmark & target setting activities
- Environmental, endurance, vibration & thermal shock
- Life test on electric/electronic components
- Corrosion test under salt fog & dust test
- EMC tests
- Diagnosis & problem solving



IMQ is the most important Italian Certification Body, European leader in conformity assessment (safety, quality, sustainability) for the electrical sector.

IMQ is **Notified Body for the RED & EMC Directives, Testing Laboratory & Certification Body Accredited** ISO 17025, 17065, 17021, 17024.

SEMI-ANECHOIC CHAMBERS Testing facilities

Up to 10 m Measuring distance

150 kHz ÷ 40 GHz Test capability with radiated emissions

20 MHz ÷ 18 GHz Test capability with radiated immunity

5 m & tons Capacity rotary table

Ready to drive & Driving Passive Dynamometer System

CHARGING STATIONS, EV VEHICLE & BATTERIES EMC Testing

Tests are performed in anechoic chambers, in laboratory or "in situ" at customer's plant in accordance with the main European and extra-European regulatory standards such as: **UNECE Regulation 10.06** | **Automotive manufacturers' standards** (AUDI, BMW, FCA, Ford, GM, PSA, Renault, ...)

Standards

- **CISPR 12 & 25:** Off-board protection
- **CISPR 36:** Off-board protection electric and electric hybrid vehicles
- **IEC 61851-21:2001 Part 21:** Electric vehicle requirements for conductive connection to an A.C./D.C. supply
- **IEC/EN 61851-22 Part 22; 61851-23:2014 Part 23:** Electric vehicle charging station
- **EN 61851-24 Part 24:** Digital communication between a D.C. EV charging station and an electric vehicle for control of D.C. charging
- EN 55025, ISO 11452-2, ISO 11452-4, ISO 11452-5, ISO 11452-8, ISO 11452-9, ISO 7637-2, ISO 7637-3, ISO 16750, ISO 10605.

Main services

Emission Measurements (FFT METHOD)

Conducted AN (up to 200A), current & CCC | Stripline | Radiated electric & magnetic | Conducted transient

Immunity Tests

Pulses on power supply up to 200A and signal lines | Bulk current injection (up to 300mA closed loop) | Radiated else (SAC 10 m) | Stripline | Portable transmitter Magnetic field | ESD immunity | Power supply variation up to 200A | EQ/IC 11 test pulse | Ford/PSA pulses

EMC Test on Battery Systems

- Lithium-ion
- Battery Management System (BMS)

Charging Discovery System - CDS

- AC Charging without communication
- AC and DC Charging with communication
- Mode 3: AC 230 C 22 KW | Mode 4: DC 108 kW
- Communication Module: PLC for CCS Type 1 and 2, GB/T 8.744,00 1, CHAdeMO

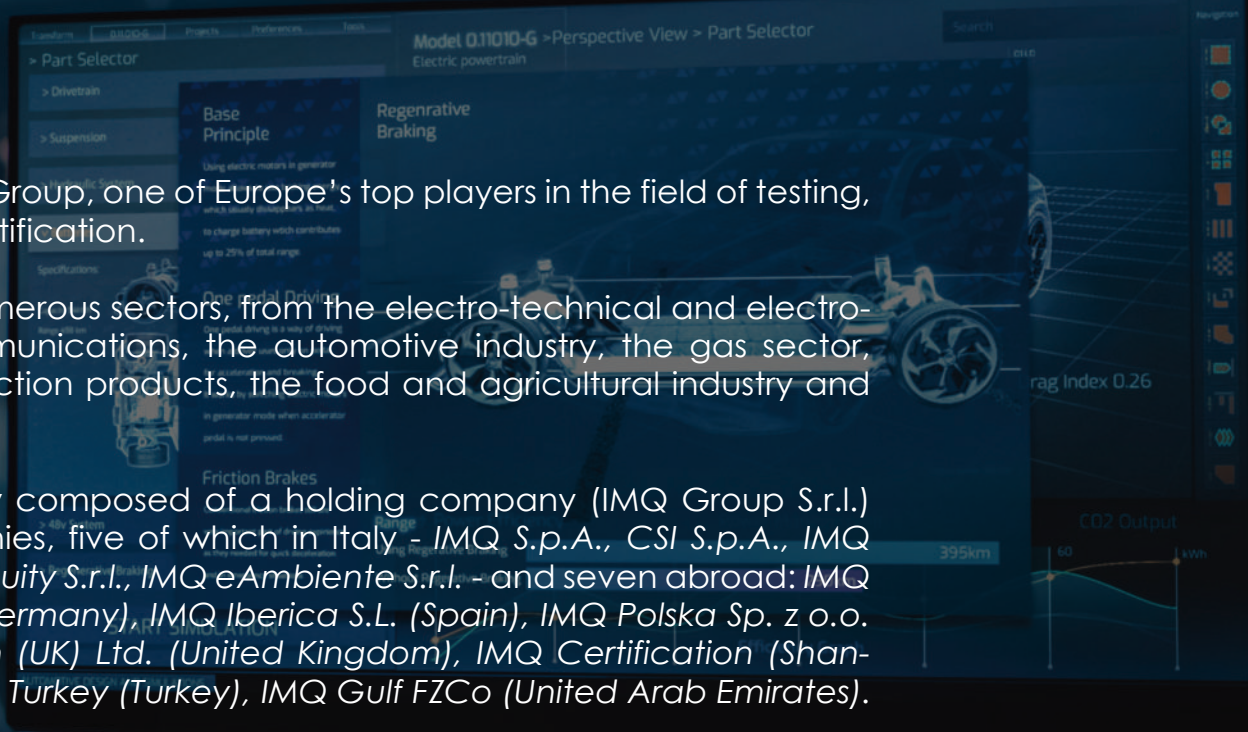
Other Services

- EV charging sockets & plugs testing & certification
- EV Ready certification
- IMQ-TECVIE certification: technical personnel working on hybrid & EV
- Software security by design (*IMQ Minded Security*)

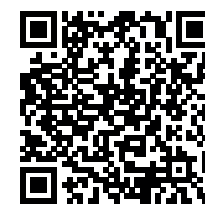
CSI & IMQ are part of IMQ Group, one of Europe's top players in the field of testing, conformity assessment, certification.

IMQ Group operates in numerous sectors, from the electro-technical and electronics industries to telecommunications, the automotive industry, the gas sector, plant engineering, construction products, the food and agricultural industry and the renewable energies.

The IMQ Group is currently composed of a holding company (IMQ Group S.r.l.) and 12 operating companies, five of which in Italy - *IMQ S.p.A.*, *CSI S.p.A.*, *IMQ Intuity S.r.l.*, *IMQ Minded Secuity S.r.l.*, *IMQ eAmbiente S.r.l.* - and seven abroad: *IMQ CSI Deutschland GmbH (Germany)*, *IMQ Iberica S.L. (Spain)*, *IMQ Polska Sp. z o.o. (Poland)*, *IMQ Certification (UK) Ltd. (United Kingdom)*, *IMQ Certification (Shanghai) Co. Ltd. (China)*, *IMQ Turkey (Turkey)*, *IMQ Gulf FZCo (United Arab Emirates)*.



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