

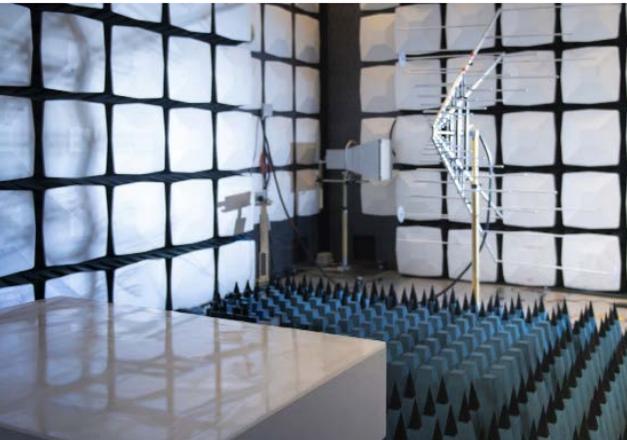
Electronics

The crucial role of integrated testing

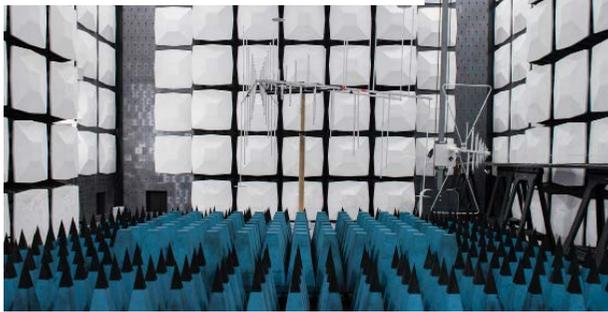
by Fabio Cevo

Why integrated testing is becoming a key factor in embedded electronics development





Semi-anechoic and shielded chamber for electromagnetic compatibility testing



Climatic room for environmental tests (cold, dry heat, damp heat, humidity test, temperature changes)

In modern embedded electronics, reliability, regulatory compliance and time-to-market are no longer independent requirements. They form a tightly interconnected system, where a weakness in one area can compromise the entire project. As electronic architectures become more complex and regulatory frameworks more demanding, testing and validation are progressively shifting from a final checkpoint to a strategic phase of product development.

A close connection between testing activities and engineering

Within this evolving scenario, integrated testing environments are playing an increasingly central role. The Eletech Test Laboratory represents an example of this approach, operating within a broader industrial ecosystem as part of the Elemaster Group's vision, within which Eletech heads the International Design Centres, R&D division. In this context, testing activities are closely connected with engineering, industrialization and manufacturing processes, enabling a preventive and design-oriented approach to compliance.

A key driver behind this evolution is EMC – Electromagnetic Compatibility – defined as a product's ability to operate correctly in its electromagnetic environment without generating or suffering interference. In complex systems such as motor drives, power electronics and control units, EMC issues rarely originate from a single cause; they are typically the result of combined design choices, layout constraints, cabling strategies and operating conditions.

These phenomena often become visible only when products are evaluated in

controlled and repeatable environments. For this reason, integrated testing is increasingly recognized as a design enabler rather than a compliance-only activity. When testing is aligned with engineering, it allows development teams to identify critical behaviours early, reduce corrective loops and make informed technical decisions before industrialization.

Early-stage analysis, troubleshooting and technical insight

The Eletech Test Laboratory supports engineering teams during the most delicate phases of development and validation, providing early-stage analysis, troubleshooting and technical insight. Equipped with a modern semi-anechoic and shielded chamber, advanced instrumentation and fully traceable measurement systems, the laboratory performs a complete range of EMC emission and immunity tests.

Geographical proximity to engineering and industrial hubs further strengthens collaboration. Shared test sessions and direct interaction between laboratory specialists and designers accelerate problem-solving activities and technical decision-making.

All EMC tests are performed in compliance with international standards and accredited according to ISO/IEC 17025:2017 by Perry Johnson Laboratory Accreditation, Inc. (PJLA Cert. nr. L25-778). Operating within the integrated framework of the Elemaster Group, the Eletech Test Laboratory contributes to transforming testing from a late-stage project risk into a strategic asset for the development of reliable, certified and market-ready electronic systems.

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