



LNE

A DRIVER FOR COMPETITIVENESS AND SAFETY

Two Fields

of Expertise: Measurement and References

MULTI-DISCIPLINARY SERVICES...

Our business is to create references and measurement methods in all technical fields (energy, environment, electricity, safety, chemistry, mechanics, statistics, quality management systems, etc.).

Our objective: to provide our customers with benchmarks and reliable results and to enable them to implement their own strategies.

Our method: to mobilise the human and technical resources required to find appropriate solutions for the various requirements of our five business divisions (research and transfer, technical support, testing and calibration, certification, training and information).

Created in 1901, the LNE (Laboratoire National de Métrologie et d'Essais) is a public industrial and commercial organisation within the French Ministry of Industry.

... FOCUSED ON ENHANCING BUSINESS COMPETITIVENESS...

In an increasingly restrictive **regulatory, economic and competitive environment**, we support businesses in their innovation and growth strategies. Throughout the product life cycle, we offer technical solutions in order to:

- optimize production tools & processes and time to market, as well as limit the number of rejects and thereby control costs;
- validate the quality and compliance of their products and increase their market value;
- improve the performance of their products, systems and services;
- control the environmental impact of their activities.

... AND HELPING SOCIETY...

Confronted with constantly changing societal challenges (citizen and consumer protection, health and safety, environmental protection), as an industrial metrology reference laboratory, we support the implementation of public policies:

- by continuing our scientific and technical development so as to anticipate measurement needs associated with technological developments and new expectations in society;
- by contributing to the development of national, European and international standards and regulations, and by taking part in market supervision.

800
employees, 80% of whom are engineers, researchers and technicians.

55,000 m²
of laboratories.

13
sites in France and abroad.

8,000
customers, 2/3 of which as SMEs.

Over 35
COFRAC accreditations*.

100
LNE experts involved in standardisation committees.



Five Key Activities

► RESEARCH & TRANSFER

Provide assistance to local authorities with the advancement and improvement of business competitiveness
• Coordination of French metrology • Association with the academic and industrial sectors in order to develop techniques for the improvement of both processes and products • Support innovation.

Types of projects conducted: redefinition of the kilogram (Watt balance), development of reference standards, development of measurement methods, modelling work for industry.

► TECHNICAL ASSISTANCE

Custom solutions for innovation, quality and performance control • Audit and complete diagnosis of processes, equipment and products • Provide assistance with design, from the drawing up of specifications to validation of the product or measurement system • Provide assistance with the development of measuring systems.

Types of projects conducted: multi-scale and multi-dimensional materials characterisation, particularly in the field of nano-materials, fire engineering studies in the railway and construction fields, validation of technical choices on prototypes, using modelling and simulation tools.



Nine Activity Areas



Industry

Your expectations: reliable measurement and control systems, reconciling industrial performance with regulatory frameworks.

Completed projects: technical assistance to reduce the sound level of equipment, performance validation of offshore oil-drilling equipment, etc.

144 calculation cores are available to model the transfer phenomenon in packaging materials.



Defence

Your expectations: equipment qualified in harsh environments in order to ensure their reliability and durability.

Completed projects: development of embedded monitoring systems on board aircraft, climatic tests on submarine periscopes, etc.

10 K: the minimum measurement threshold of an automated calibration chain for extreme-environment temperature sensors.



Energy

Your expectations: measurement and qualification methods for the control and safety of production facilities.

Completed projects: assistance provided for the development of temperature sensors for the maintenance of nuclear power stations in order to improve the reliability of tankers for the transport of liquefied gas, etc.

100 years: prediction objective for the life of a sealing gasket in nuclear applications.



Transport

Your expectations: equipment performance and user safety.

Completed projects: environmental stress simulations (climatic, mechanical, etc.), chemical and physico-chemical analyses, rail transport fire propagation simulations, etc.

21 partners of the European Transfeu project are guided by LNE.



Instrumentation

Your expectations: increasingly accurate, traceable and reliable measurement methods.

Completed projects: implementation of measurement chains in an industrial environment, exploitation of the results, measuring instrument inventory management, etc.

300 kV: the maximum voltage of a transformer tested at LNE.



▶ TESTING & CALIBRATION

Performance evaluation of products at all stages of their life cycle • World-class calibration services either on-site or in our own laboratories, for all types of measuring instruments.

Types of projects conducted: calibration of temperature sensors for harsh environments in the nuclear industry, electrical safety tests on artificial hearts.



▶ CERTIFICATION

As part of a voluntary or regulatory approach: product and service certification (over more than 60 product families) and management systems to meet the requirements of the French, European, American and Asian markets.

Types of certifications issued: CE marking (for more than 20 Directives), certifications under ISO 9001, ISO 14001, ISO 13485 (medical field), LNE Packaging certifications and LNE Hygiene HACCP.



▶ TRAINING & INFORMATION

Intra and inter-company training courses, technical information days, courses at all levels, e-learning and webinars • Scientific publications, recommendations as part of the standardisation activity, publication of technical guides and white papers.

Training topics: metrology, quality management, medical and industrial issues.



Public Authorities

Your expectations: measurement methods to meet the challenges posed by safety and sustainable development issues.

Completed projects: diagnosis of heat loss through buildings' roofs and walls using aerial infrared thermal imaging, etc.

5,200 km² overflowed in France, as part of aerial thermal imaging campaigns.



Healthcare

Your expectations: reliable and certified medical devices and analytical methods.

Completed projects: evaluation and certification of medical devices, development of reference methods for dosing the main biomarkers used in clinical biology, etc.

1,200 certificates issued every year.



Construction Products

Your expectations: high quality construction products combining performance and sustainable development.

Completed projects: performance assessment of renewable energy devices, fire reaction tests and CE marking of materials, etc.

20 certification marks managed and issued by LNE.



Consumer Products

Your expectations: domestic appliances that combine quality, safety and compliance.

Completed projects: performance and fitness-for-purpose testing (mechanical and electrical safety, etc.), energy consumption and durability tests, etc.

47: number of French or European standardisation committees in which LNE participates each year.

Research:

A Core LNE Activity

By devoting 25% of its budget to French and international research, we are continually enhancing our knowledge to provide the best response to industrial challenges.

OBTAINING AN EVER MORE ACCURATE MEASUREMENT

In step with scientific, technological and regulatory developments, regardless of the fields of application, our research has two principal objectives:

- to provide ever finer measurement traceability, by means of experimentation and via the use of Système International (SI) units, the development of national standards, the development of calibration benches in order to ensure consistency between user standards and national standards;
- to contribute to regulatory framework changes, by developing analytical and test methods for products and devices, particularly by means of standardisation work.

RESPONDING TO MAJOR SOCIETAL CHALLENGES AND THE NEEDS OF INDUSTRY

Since 2005, we have been guiding the French national metrology network which is involved in 70 projects within the European Metrology Research Project - EMRP (new radiotherapy techniques, biofuel references, etc.). We are thereby collaborating with a vast network of scientific and technical partners: national metrology laboratories, associated laboratories and numerous European organisations.

PROMOTING INDUSTRIAL DEVELOPMENT AND INNOVATION

80% of global trade involves tests and measurements that confirm compliance with regulations and standards. In this context, we endeavour to transfer our knowledge to the industrial sector through our involvement in a large number of business clusters (aeronautics, composite materials, nutrition, economics, digital, etc.) and in a dozen or so scientific interest groups and networks. We make our databases fully available to them, particularly in the field of food contact and fire safety. Furthermore, since the characterization of materials is essential for industrial companies, we develop dedicated platforms combining all associated businesses, such as CARMEN for the characterization of nano-materials, and MATIS for thermal and optical material characterization.



New Thompson-Lampard electrical capacitance standard.

25%
of the LNE budget is devoted to research.

25
doctoral students and nearly 180 PhDs and engineers.

18%
of LNE R&D programmes contribute to standardisation projects.

90
publications in peer-reviewed journals.



Nano-object metrology: use of the scanning electron microscope at the CARMEN platform.



Worldwide Expertise

Enjoying international recognition, LNE supports and assists customers with design, manufacturing, distribution and marketing for their products around the globe. To strengthen this effort, our specialized branches are located in key areas and focused on strategic domains. The opening of an office located at the heart of an economical horsepower, California, illustrates LNE's strategy: offer customers with local presence and expertise.

IN THE UNITED STATES

Established in Washington, DC and California (Roseville) – **LNE / G-MED North America** is dedicated to provide certification services for all types of medical devices, attesting of their conformity with European directives and regulations in the United States, Brazil, Canada, etc.

LNE America spreads the skills and services of LNE France by offering technical support to local businesses in construction, transport and retail to sell their products on the European market.

IN ASIA

LNE Asia and LNE China, located in Hong Kong and Shanghai, provide technical support, training and consultancy to the local manufacturing sectors: audits, tests and inspections and the issuing of certifications, particularly within the context of the CE marking scheme. Their main activities are in consumer goods, instrumentation and healthcare.

25%
foreign customers.

800
international audits
carried out in 2012.

60
research projects
conducted with
European partners.

