

HISTORY - THE WAY THROUGH

Our company was established 30 years ago and has been mainly involved with lightning protection and earthing of structures and buildings, as well as with surge overvoltage protection of electrical and electronic systems.

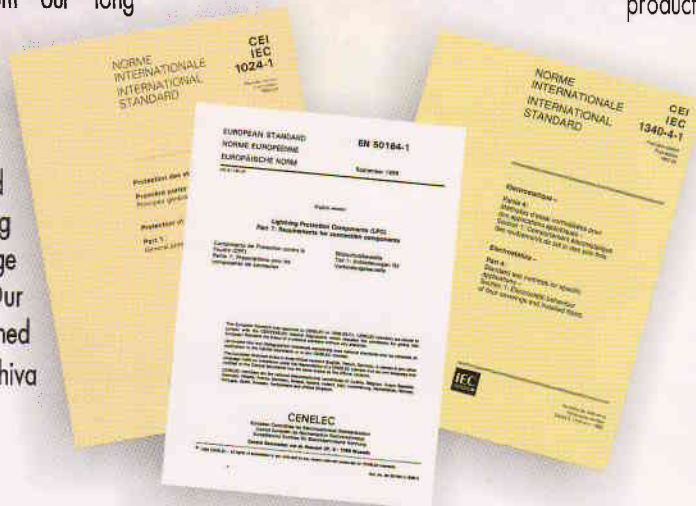


Having retained our basic business principles and philosophy, which include our duty to offer high quality products and services, along with our experience and the scientific and technical knowledge we have gained from our long cooperation with Research Departments of many Universities and other companies in Belgium, France, Switzerland, Greece, USA and UK, we established a Research and Certification Centre for Lightning Protection Components (LPC) and Surge Protective Devices (SPD). Our laboratory is located in a privately owned 1.500m² building close to the city of Thiva (Thebes).

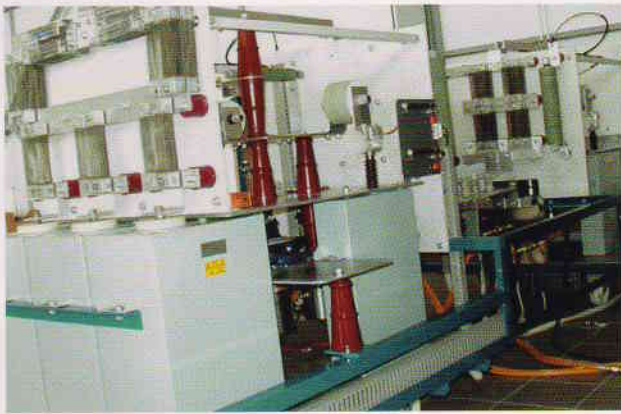
STANDARDS - TESTS

The New European Standards (EN) for Lightning Protection Components (LPC) EN 50164-X and Surge Protective Devices (SPD) EN 61643-XX, along with the standard EN 62305-X which is presently under compilation, are obligatory for all countries which are members of the European Union and they replace all their relevant National Standards (e.g. BS - UK, DIN - Germany, ELOT - Greece, NF - France, etc.). The New EN Standards include tests procedures and results criteria according to which all LPCs and SPDs that are installed in Lightning Protection Systems (LPS) must undergo strictly determined electrical, mechanical and environmental tests. Main objective of these tests is to certify that the material under testing is able to withstand the lightning current and can therefore offer the necessary quality protection to buildings, electrical and electronic systems for many years. More specifically, the electrical tests for LPCs take place under lightning currents of negative polarity with wave shapes 10/350 μ s, whereas for SPDs and spark gaps under surge currents 10/350 μ s, 8/20 μ s, surge voltages 1,2/50 μ s.

Our equipment is able to perform tests on many other products and structures as well, which have to undergo similar tests to the ones mentioned further down.



SURGE CURRENT GENERATOR 10/350 μ s/100kA



Our Lightning and Surge Current Generator is able to produce, apart from the typical wave shapes 8/20 μ s, 8/80 μ s and 10/350 μ s, surge currents of any wave shape within front time $T_1=4$ and tail time $T_2=20$ up to 500 μ s.

The peak values (I_{peak}) of the output current can vary from 5 kA up to 100 kA, with maximum stored energy 187kJ and maximum charge transferred to the specimen 80 C.

Due to the modular construction and configuration, the generator is also capable to perform for research purposes simulation tests of multiple lightning stroke applications with currents having a maximum value 50 kA.

In combination the lightning impulse voltage generator and long duration generators, with which our laboratory is equipped, are able to perform multiple stroke (synthesis) tests that are included in European (EN) and International (IEC) Standards. Apart from the tests performed on LPCs and SPDs, we are also capable to test the ability of other structures such as wings and axes of wind power generators and helicopters, radar antennas, parts of airplane and ship components, submarines periscope towers, metal parts of bridges, reservoirs and fuel tank installations, wire ropes of cable cars, etc which should also be able to withstand a lightning impact.

SURGE VOLTAGE GENERATOR



It can produce surge voltages from 5 kV up to 500 kV of wave shape 1,2 / 50 μ s and switching impulse voltages up to 460 kV with a wave shape 250/2500 μ s, 12,5 kJ.

Apart from the tests performed for lightning and surge protection applications, the insulation testing of cap and pin or post insulators, power cables, switchboards, as well as insulation materials is also possible.

IMPULSE CURRENT GENERATOR 8/20 μ s / 50kA

The particular impulse current generator is mainly used for testing of low voltage Surge Protection Devices. It is able to deliver 1-50kA (8/20 μ s) with selectable polarity (positive or negative) or 2 x 25 kA, which allows simultaneous testing of two ports SPDs. The impulse current may be superimposed on 230V 50Hz AC signal



with a mains synchronisation triggering unit between 0° - 360°. This is a standard requirement for the operating duty test of class II testing method for type 2 SPDs according to Standards IEC 61643-1 and EN 61643-11. Routine tests may be done thanks to the microprocessor controller of the generator, which allow to set up particular sequence tests. Maximum source impedance 0.1 Ω , 1 μ H with a maximum charging voltage of 6.25kV.

IMPULSE CURRENT AND VOLTAGE GENERATOR / COMBINATION WAVE 8/20 μ s (6kA) AND 1.2/50 μ s (12kV)

The particular impulse current generator is able to deliver a combination wave composed of a current impulse with a magnitude of 0.1-6kA (8/20 μ s) and an impulse voltage with a magnitude of 0.2-12kV (1.2/50 μ s) with a selectable polarity (positive or negative). The combination wave may be superimposed on 5-110V DC signal but also on 230V 50Hz AC signal with a mains synchronisation triggering unit between 0° - 360°. Combination wave impulse testing under DC is required by surge protection devices used in telecommunication and signalling networks according to IEC 61643-21 and EN 61643-21. Also under AC is



required by the operating duty test of class III testing method for type 3 SPDs according to IEC 61643-1 and EN 61643-11. Routine tests may be done thanks to the microprocessor controller of the generator, which allow to set up particular sequence tests.

ENVIRONMENTAL TEST DEVICES

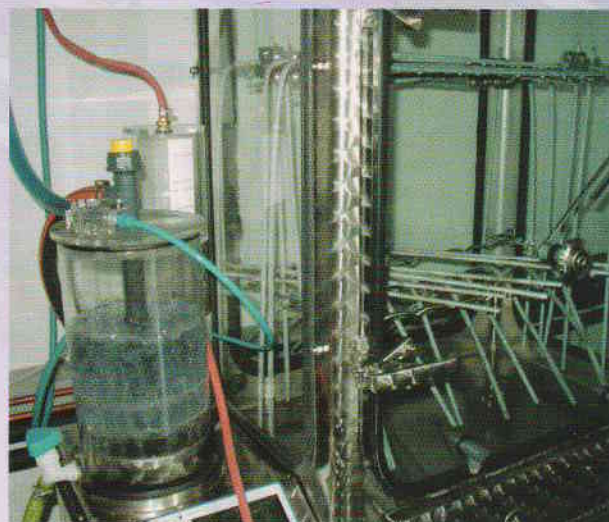
These devices are able to perform environmental aging tests on metal components and conductors installed at lightning protection



systems as well as at other applications located in places with various environmental conditions such as cities, marine or industrial areas, in air or buried in ground. The devices, which are programmed to operate automatically, adjust, within the device chamber in which the specimens are located, the conditions of humidity, temperature, gas and salt capacity within a given time duration and cycles determined by the Standards.

The tests that we perform satisfy the following Standards: EN 60068, EN-ISO 6988, EN-ISO 6957, EN 50164-1/annexes C1, C2, C3, EN 50164-2/annex D, EN 60068, EN-ISO 6988, EN-ISO 6957.

The performance of environmental tests according to other standards and requirements is also possible on metal components of any material used for connection and support of electrical aerial



and underground networks, plumbing installations, construction material and generally various metal structures.

MEASUREMENTS OF NATURAL SIZES

Electrical Conductivity

Measurements of electrical conductivity of materials from 100n Ω up to 2k Ω may be performed with measuring currents ranging from 100mA up to 10A and an accuracy of $\pm 0,2\%$.

Thickness of covering layers on metals

Measurements of the layer of thickness of metallic or dye coverings on ferrous and non ferrous metals of various forms are possible, from a thickness of 0,1 μm up to 1000 μm with an accuracy of $\pm 0,1\mu\text{m}$.

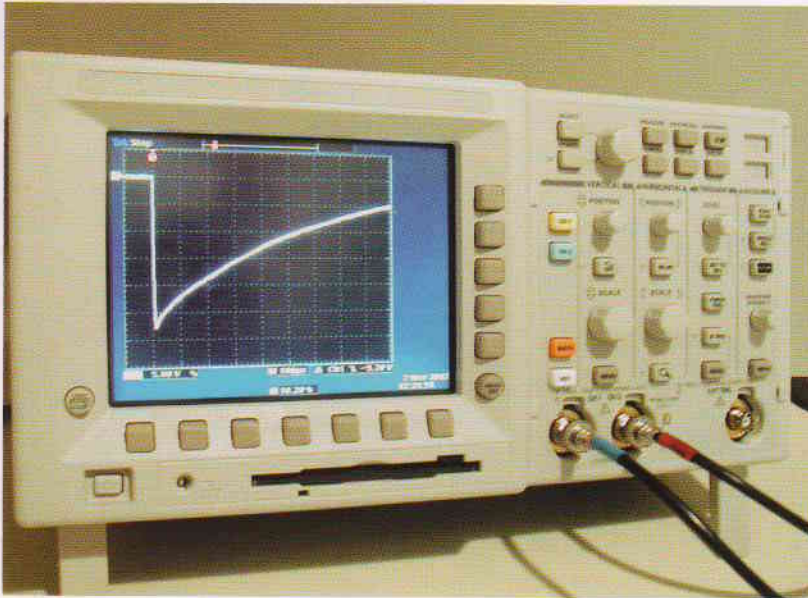
TEST RESULTS REPORT

For every laboratory test or inspection that takes place at our facility, a Test Results Report is compiled. This includes all the Standards' references according to which the tests and measurements took place, a test equipment-apparatus description, a test procedure description, a measurement table(s) and result discussion section, oscillogram recordings section and conclusions.



CERTIFICATES

A Certificate of the product's conformity can be issued upon the customer's request and only in the case that tests were performed successfully according to the requirements that were dictated.



PERSONNEL

Our laboratory staff is comprised of scientists and engineers specialized in surge currents and voltages, which are able to undertake and accomplish successfully even the most peculiar tests and experiments. Additionally, our close cooperation with other certified laboratories and research centres globally, along with our continuous active participation at European and International Conferences, provide added value and credibility to the quality of our services.

RESEARCH

The exceptional and modern equipment of our Research Centre gives us the opportunity to perform research and design of new products, as well as to study in more depth the lightning current and the effects it may have on human structures and protection devices. The results of these investigations have been announced at International Conferences and discussed at European and International Technical Standardization Committees.

TRAINING - EDUCATION

Aiming to increase the quality of Lightning Protection Systems, Earthing Systems and Protection Systems against Surge Overvoltages, which have to be in accordance to the New European Standards, we have included in the educational seminars that we have been performing for the last 18 years, special seminars about Standards and the required tests that all LPC and SPDs must undergo.

