



INT AR, SL

[www.int-sl.ad](http://www.int-sl.ad)

**Innovation for prevention, safety and protection against lightning**



**Integrated Quality, Environmental and Product Management System ISO 9001:2008 / ISO 14001:2004. Product certification No. ESO11889 from BUREAU VERITAS Certification. Prevention of occupational hazards** Law 31/1995 of 8 November, BOE No. 269, of 10 November and Royal Decree RD 614/2001 of 8 June, BOE of 21 June. **Electromagnetic Compatibility** in accordance with EN61000-6 (1-2-3-4):2002 and EN61000-4-2 to EN61000-4-9, EN55011 to EN55015 and EN55022 (adapted to IEC standards). **Comparative High Voltage Tests** in accordance with NFC-17102/UNE-21.186. **Applicable standards** UNE/EN 62305 (1-2-3), corresponding to the international IEC 62305/2006 standard (1-2-3).

# INT AR SL

Pure innovation in worldwide expansion



## Collaboration agreements with technology centres

Over 7 years demonstrating the efficacy of Electrostatic Charge Deionizing Lightning Conductors in high-voltage laboratories and in installations located in zones with a high risk of lightning strikes.

We uphold collaboration agreements with the Technology Centres of universities, foundations and associations of telecommunications engineers, with a view to manufacturing, under the active improvement tax regime, suspension for direct evaluation system, granted by the Government of Andorra.



## Prevention Safety Protection

At INT AR, SL we have been **researching, developing, manufacturing and distributing** new technologies since 2003. We are based in the Principality of Andorra and present in Andorra, the rest of Europe, Asia, South America, Mexico and Central Africa, and are constantly expanding worldwide. We have our own **patent for the cutting-edge Electrostatic Charge Deionizing Lightning Conductor (PDCE)** the operating principle of which is based on eliminating the high-voltage electric field.

Years of research, market studies, analysis of electrical risk, accident audits and hard work have enabled INT AR, SL to develop the revolutionary lightning protection system, which has clear technological advantages over conventional lightning conductors.

## QUALITY

At INT AR, SL we research and develop technology in accordance with the **strictest quality processes**, supervised and audited by the company Bureau Veritas. We have certifications in accordance with international standards ISO 9001:2008 for Integrated Quality Management and ISO 14001:2004 for Environmental Management and our products comply strictly with applicable legislation for the prevention of occupational hazards in accordance with Law 31/1995 and Royal Decree 614/2001.

Our work is performed in strict **compliance with national and international directives** 2001/95/EC on General Product Safety; 89/336/EEC on Electromagnetic Compatibility; 73/23/EEC on Electrical Equipment designed for use within certain voltage limits.

## CUSTOMERS

The areas with which we work mainly include the **telecommunications, domestic, oil, filling station, industry and sailing sectors**. We are currently proud to have customers that include Abertis-Telecom, Itelazpi, the Basque Government, the Association of Chartered Surveyors, the Technical Architects and Building Engineers of Girona, France Telecom, Indra, Aena and Pemex. We thank these and other future customers for the trust they have placed in us.

In reward for our work, companies such as PEMEX, AENA and INDRA have approved the product for installations in their sectors of work.



# LIGHTNING CONDUCTORS PDCE

(Electrostatic Charge Deionizing Lightning Conductor)

The function of the PDCE is to **stop the lightning process** by preventing its formation through the elimination of the ionisation effect.

**Technological innovation makes it possible to create a balanced electrical atmosphere between the ground and the structure to be protected.** During a storm, a potential difference appears between the cloud and the earth (charges). These charges are concentrated in the points of the earth that project most. The new technology undertakes to transform them as they appear in a weak current leaked through the earth cable to the earth connection.

It is a non-polarised, passive collector electrode used as a collective means of **protection for any kind** of structure on land or at sea.

The PDCE, a **prize-winner for its design and technological innovation**, complies with the strictest safety and electromagnetic compatibility requirements, which ensure its status as the **lightning conductor** of the future for the protection of people, animals and assets.



The PDCE (Electrostatic Charge Deionizing Lightning Conductor) system is also known as the Lightning Protection System (LPS), based on the principle of the Charge Transfer System.

The PDCE is manufactured in aluminium, stainless steel, methacrylate and nylon. It contains neither electronic components nor radioactive materials.

**Models: PDCE - Senior** - range: 100 m.  
**PDCS - Junior** - range: 25 m.



## THE OPERATING PRINCIPLE of electrostatic charge deionisation

### THE NATURAL ELECTRIC FIELD ON EARTH

B. Franklin used Ohm's and Joule's laws to show that two types of currents (negative and positive) coexist in the atmosphere. While the storm cloud (cumulonimbus) is forming, it becomes a primary electrical condenser and generates a very large high-voltage field, which changes the electrical behaviour of the atmosphere and causes variation in resistance (R) and inductance (L) values. The phenomenon prompts the appearance of variable voltage on earth, which exceeds the air's electrical resistance limits and electrifies elements on the ground. The value of this electric field on earth is proportional to the cloud's charge and inversely proportional to the low electrical resistance of exposed elements on earth. It may exceed a value of 120 V/m at very high voltage.

### IONISATION

A constant electric field prompts the ionisation of exposed elements on earth, which create tracer paths that communicate the two points (cloud-earth) electrically and open up a conductor path for the charge of energy in lightning form. If elements are pointed, there is a greater chance that these charges will flow through them (conventional lightning conductors).

### LIGHTNING

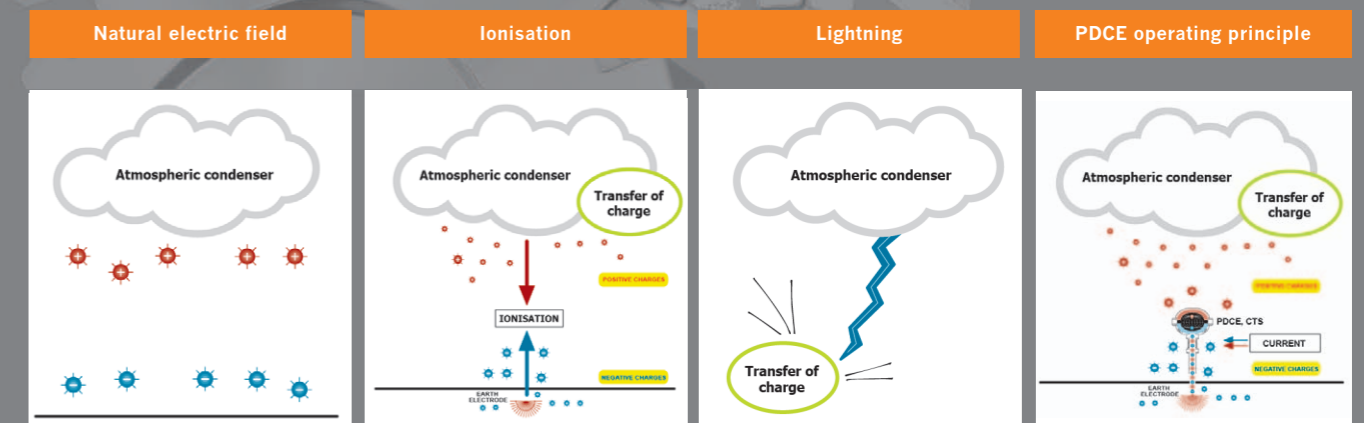
The chances of the occurrence of lightning vary in accordance with the dielectric conditions of the air, the value of the high-voltage electric field, the ease of transfer of ionising element charges, and a cloud's speed and charge.

### PDCE LIGHTNING CONDUCTOR OPERATING PRINCIPLE

The rod is a condenser that is connected to earth by the bottom electrode and exposed to the atmosphere by the top electrode. The PDCE has no polarity but it does have capacity to dissipate 570,000 volts per microsecond, thus cancelling ionisation at the rate of a metre per second without producing either lightning discharge or short-circuit.

On earth, opposite sign charges are induced that rise through projecting elements on the ground, depending on the intensity and polarity of the charge of the cloud. If there are electrical conductors, the charges will use these as a means of transport because of their lower exchange resistance, in order to compensate the difference in potential.

The PDCE does not require voltage. The bottom head is negatively charged and induces the upper head to balance the potential difference by attracting opposite sign charges. During the increase in potential difference between the two PDCE electrodes, there appears an orderly flow of electrons (current) that is leaked to earth and prevents the condenser from charging, thus transforming the charges into current. The result is a weak current flow (microamps) that is leaked constantly (during the storm), which cancels the high-voltage electric field.



Ionisation occurs from 1,200 volts upwards in any element exposed to a high-voltage electric field. Constant ionisation gives rise to air saturation (dielectric) and the appearance in the air of ionised tracers or paths, along which energy from lightning can flow and the discharge can appear. Any condenser that is earthed and exposed to a high-voltage electric field will generate a potential difference within its electrodes, which will give rise to the appearance of an orderly flow of current, given that an electrode is connected to earth. The condenser cannot charge because of constant leakage to the earth connection. This opposite process to ionisation is called DEIONISATION.

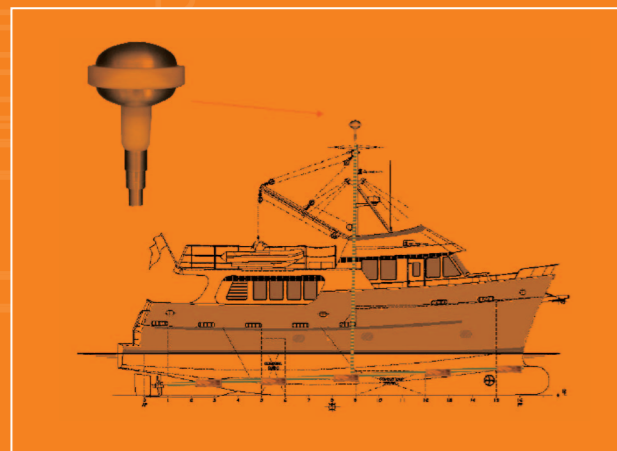
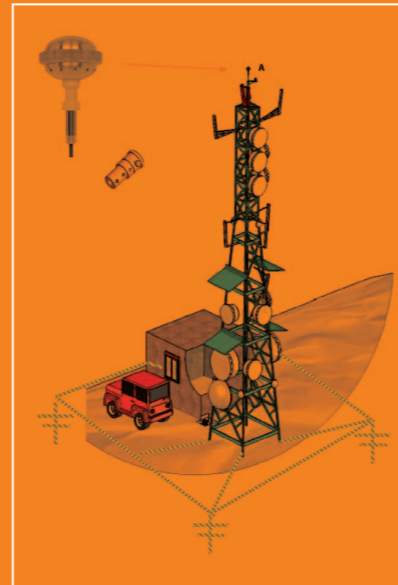
# ANALYSES PRIOR TO INSTALLATION

A study of needs, the subsequent analysis of the data, and the presentation of a report on risks are required prior to installation in order to ensure that needs are properly covered.

The **study of protection needs** provides the basis for a definition of the technical needs, which involves assessment of parameters such as the construction type, the geographical location, the environmental context, the type of terrain and any elements that may perturb the electric field.

Analysis of the data collected is followed by the **production of a report on the risks and technical requirements of protection**, in accordance with the environmental context, the external electromagnetic influences and residual voltages, and other factors that prompt more risks than the natural electric field on its own.

This study will define needs regarding lightning conductors, mast, copper and perimeter earth cable, and earth equipotential bonding, etc.



# INSTALLATION PROCESS

In the installation process, the PDCE is fitted to project 2 metres above the top of the buildings and structures. On vessels it is fitted to the mast using a support designed to withstand winds of over 250 km/h.

Installation on vessels is simpler as it is done with consideration for the technical needs of protection, thus yielding economic and design benefits and optimising points such as the earth connection, copper down pipes, over-voltage protectors and the tailored construction of the mast to suit needs.

# TECHNOLOGICAL CHANGE

aimed at prevention, safety and protection

Because of deionisation of electrostatic charge, the PDCE guarantees a **99% reduction in lightning impact on all buildings and structures.**

Unlike conventional lightning conductors that prompt stoppages in installations as a result of lightning, travel to repair breakdowns, a risk of accidents at work because of electrical impact, and compensation worth millions, the PDCE yields benefits that include **guaranteed reliability** of IT systems and data during storms, **optimised production, increased competitiveness** and **improved safety** for staff.

## TECHNOLOGICAL DIFFERENCES BETWEEN PDCE AND CONVENTIONAL LIGHTNING CONDUCTORS

	PDCE lightning conductor	Conventional lightning conductor
	✓ It neither excites nor captures lightning.	✗ It excites and captures lightning.
	✓ It protects all kinds of structures and environments in which there is a risk of fire or explosion.	✗ It does not protect all kinds of structures and environments in which there is a risk of fire or explosion.
	✓ It does not cause over-voltage.	✗ It causes over-voltage.
	✓ It prevents electrical hazards.	✗ It creates electrical hazards.
	✓ It is applicable in the prevention of occupational hazards.	✗ It is not applicable in the prevention of occupational hazards.
	✓ It complies with the basic requirements of the Technical Building Code.	✗ It does not comply with the basic requirements of the Technical Building Code.
	✓ It complies with the Low Voltage Electrotechnical Regulation.	✗ It does not comply with the Low Voltage Electrotechnical Regulation.
	✓ It does not generate Electromagnetic Compatibility effects.	✗ It generates Electromagnetic Compatibility effects.
	✓ The earth connection is compatible with low-voltage electric earth connections in accordance with the Low Voltage Electrotechnical Regulation.	✗ The earth connection is NOT compatible with low-voltage electric earth connections in accordance with the Low Voltage Electrotechnical Regulation.
	✓ It is not radioactive and is manufactured in accordance with RoHS regulations.	✗ Some are radioactive.
	✓ It is environmentally friendly.	✗ It indirectly generates electromagnetic pollution.
	✓ The product is certified by Bureau Veritas.	✗ The product may NOT be certified as it does not meet the target of protection.
	✓ It has a highly competitive price with regard to safety.	✗ The price is NOT competitive with regard to safety.
	✓ It comes with a guarantee against manufacturing defect.	✗ It DOES NOT come with a guarantee of protection.

## ANALYSIS IS OF RISKS - COSTS - EFFICACY

Lightning conductor system	Electrical risk	Risk of accident	Safety value	System efficacy	Return on investment
PDCE	↓ LOW	↓ LOW	↓ LOW	↑ HIGH - 99% NO LIGHTNING	↑ HIGH - 99% NO LIGHTNING
Conventional	↑ HIGH	↑ HIGH	↑ HIGH	↓ LOW - 99% WITH LIGHTNING	↓ LOW



## Climate change has yielded a need for efficient prevention, safety and protection against lightning.

PDCE lightning conductors guarantee efficient and profitable protection without the limitations of conventional lightning conductor systems.

AON.ad



Manufacturer



[www.int-sl.ad](http://www.int-sl.ad)



Distributor / Installer



Nuevas Tecnologías Ecológicas

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