IONIFLASH LIGHTNING CATALOGUE: IONIFLASH MACH 30, IONIFLASH MACH 45, IONIFLASH MACH 60

PHÂN PHỐI KIM THU SÉT IONIFLASH MACH 30, IONIFLASH MACH 45, IONIFLASH MACH 60

FRANCE PARATONNERRES®

IONIFLASH MACH®

Our liability is your first insurance

Qualifoudre INERIS N°: 051168729019

FRANCE PARATONNERRES®

RELIABLE AND SURE

THE TECHNOLOGY IONIFLASH MACH®

Our liability is your first insurance

LIGHTNING / NATURAL PHENOMENON

Lightning is a natural phenomenon which occurs in a violent and unpredictable way and is very recurrent in some areas of the planet. Although it contributes to the electric stability of the earth, its effects are devastating.

CONSEQUENCES

It causes billions euros of loss to the economy of a country, and lightning creates thousands of deaths and serious injuries.

SOLUTION : The IONIFLASH®

Research efforts at France Paratonnerres have headed to the development and improvment of its technology by the achievment of the E.S.E. (early streamer emission) IONIFLASH MACH® (patented). The efficiency of the IONIFLASH MACH® has been demonstrated even after several lightning strikes on it.

A technology with proven results

WHAT IS THE PRINCIPLE ?

IONIFLASH MACH® protects against all lightning strikes, positive or negative, by activation of the internal system released by atmospheric induction.

The ionization created at the coaxial spark gap top by generation of electric arcs, in a fraction of a second, increases the conductivity of the air and the speed of the propagation of the upward leader.

Being propagated towards the cloud, this discharge, generates an electric field which inflects the effect of the downward lightning stream leader, until the lightning strikes with neutralization by the IONIFLASH MACH® device.

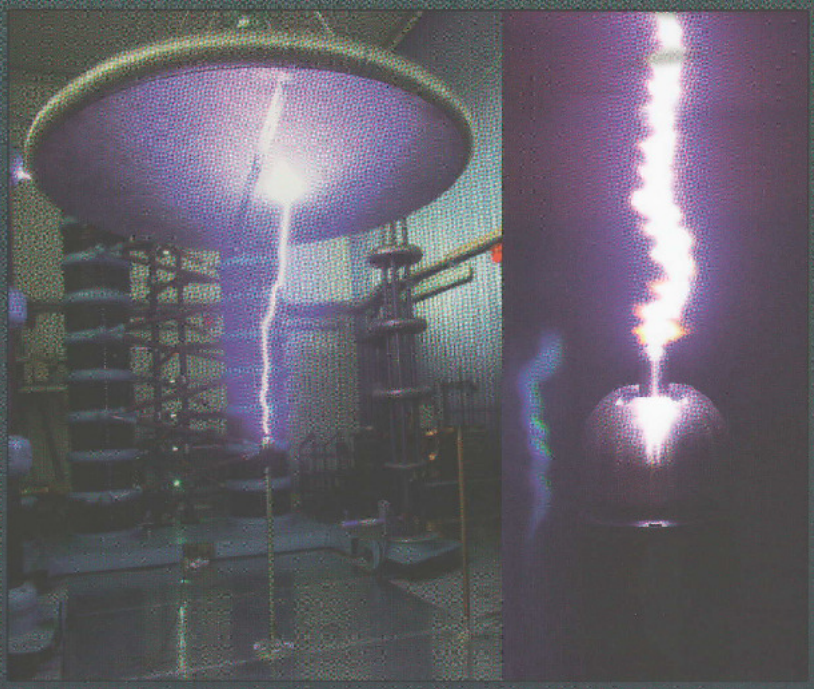
- GUARANTED 5 YEARS
- CONFORM TO THE NATIONAL NORMS NFC 17-102, UNE 21186 – CAPTURE SYSTEM CONFORM TO THE NORMS EN 50-164, AS PRESCRIBED IN THE NORM EN 62305.
- 100% RECYCLABLE, EXCELLENT CARBON IMPACT
- NO FRAGILE COMPONENT, EXCELLENT RESISTANCE TO CORROSION EVEN IN EXTREME CLIMATIC CONDITIONS (UNDER NORM PRESCRIPTIONS)
- EASY TO INSTALL
- OPTION OF TESTABILITY AT DISTANCE ON THE IONIFLASH MACH®60

LABORATORY TESTS

FRANCE® PARATONNERRES

TESTS IN SITU

Historic of laboratory tests



1996 Laboratory of Very High Voltage of University of Pau : Fundamental research carried out over 3 months focusing on different ESE air terminal systems.

2004 SHANGAI JIAO TONG University/China : Tests of performances of IONIFLASH according to the NF C 17-102 standard. Results validated by High Voltage Laboratory of University under Report N°00.4003 dtd 10.08.04

2009 Laboratory of Very High Voltage of University of Pau : Homologation of the IONIFLASH MACH® 30, IONIFLASH MACH®45, IONIFLASH MACH® 60, in conformity with the NF C 17-102 standard of 01/2009.

2009 Laboratory Ampere CNRS (*) of LYON .
(*)National Scientific Research Center
The tests on IONIFLASH MACH® have demonstrated a early streamer emission superior to 60 µs, and a constancy of reaction to the choes with no equal.

The IONIFLASH MACH® accelerates in a significative and controle way beside other ESE, the generation of the germ electron, precursor of the upward leader. The lightning strokes in waves 10/350 µs at 100 kA, have shown an excellent mechanic and electric behaviour of the IONIFLASH MACH®, with a perfect flow of lightning

PERFORMANCES REGISTERED IN SITU

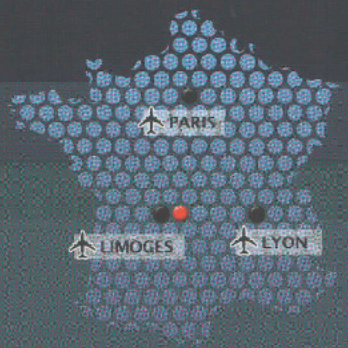
1988 - FRANCE TELECOM :
An on-site comparative test, during one year, has been carried out between our IONIFLASH and a simple rod, on a FRANCE TELECOM pylon.

In one year, 7 lightning strikes occurred on our IONIFLASH, and none on the simple rod, of the same height.

M.Damour, Contribution to the debate on efficiency of ionisating air terminals, Electricity General Review RGE N°7/91, pp 14-17.

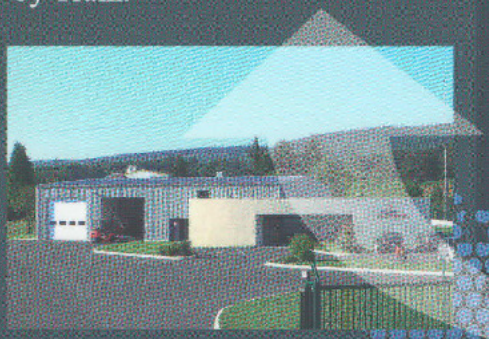
2009 - Test in situ under process

IMPLANTATIONS



GEOGRAPHIC LOCALISATION

FRANCE PARATONNERRES is situated 1 hour from Limoges by car, and 3 hours from Paris by Train.



France Paratonnerres worldwide

FRANCE PARATONNERRES is managing its own Research and Development Lab, and Assessment Evaluation Department and is dedicating an important budget to innovation, through strengthened partnerships with Scientific and Research Centers.

FRANCE® PARATONNERRES

Our liability is your first insurance

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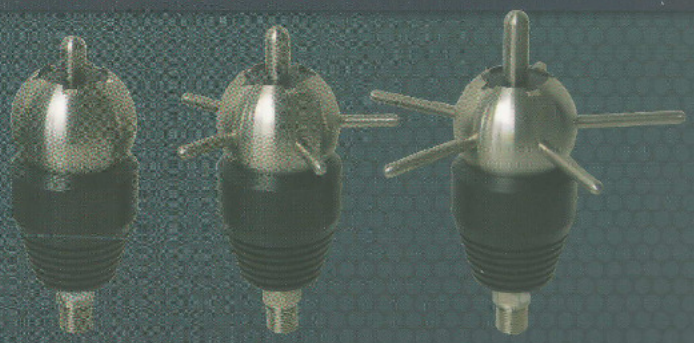
FRANCE PARATONNERRES

EARLY STREAMER EMISSION AIR TERMINAL

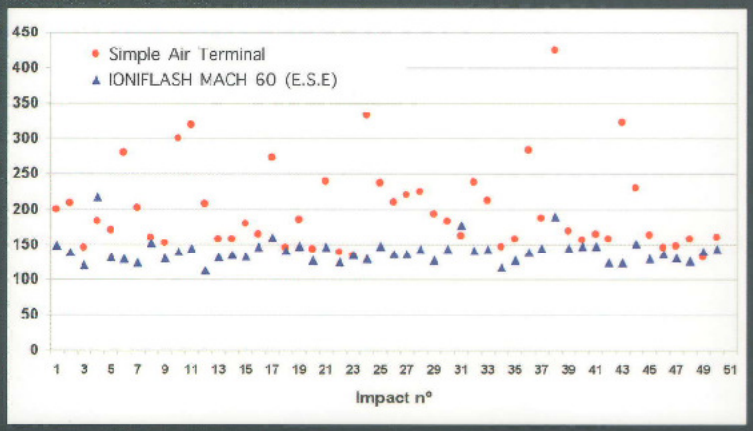


IONIFLASH MACH®

MACH 30	MACH 45	MACH 60
87 µs	114 µs	135 µs
31%	47%	56%

Note: The NFC 17-102 standard limits the early streamer emission to 60µs.

- A high level of early streamer emission △t :
- Security coefficient more important :
- Very low dispersion of its performances, with respectively for each standard deviation: σ(M30)=32 µs, σ(M45)=19 µs et σ(M60)=18 µs
- Working well adapted to the Lightning frequency range (0 to 10MHz)
- Is not sensitive to bad weather with its internal spark gap
- 2 Spark gaps proportioned in order to have an adapted range of functioning and this, whatever the meteorological conditions are. (Rain, snow, hail…)



Tested at Ampere CNRS Laboratory in Lyon

- No electronic device => No energy consumption
- Electrostatic activation of the streamer emission device during the increase of electromagnetic field of the earth.
- No fragile component => Metallic parts in Stainless Steel
- Functioning still optimum after 2 serial tests with 7 lightning strokes in normalized wave 10/350 µs at 100kA (In positive and negative polarity)
- The eco-conception of the IONIFLASH MACH is implemented being concerned by the environment. Its Carbon Assessment is excellent.
- Patented Technology
- 5 Years Guarantee
- Life duration > 50 years.

In accordance with NFC 17-102 and UNE 21-186 standards.
Capture device conform to the EN 50164 norm, as prescribed in the serial standards (BVQI /Qualifoudre) of EN/CEI 62305.

BVQI Qualifoudre INERIS N° 051168729019

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FRANCE® PARATONNERRES
INTEGRATED SOLUTIONS

INSTALLATION

France Paratonnerres, strong of its 30 years of experience and know-how acquired, offers you a totally integrated solution :

SKILL :
On basis of its softwares of Lightning Risk Assesment Survey
(Environmently Sensitive Classified Industries : E.S.C.I.sites ...)

- Technical Survey
- Control of installations according to NF C 17-102, NF C 15-100 and EN 62305 standards.

PRODUCTION AND COMMERCIALISATION
Of protection devices

- Air Terminals, lightning counters , earth rods...
- Surge arresters...

INSTALLATION OF PROTECTION DEVICES

- Lightning protection of all building sites : E.S.C.I., historic monuments, administrations...
- Storage and packaging of radioactive air Terminals

TRAINING
F.P.F. Center registered :

- Lightning Risk Analysis
- Standards and regulations of installations
- Technical assistance

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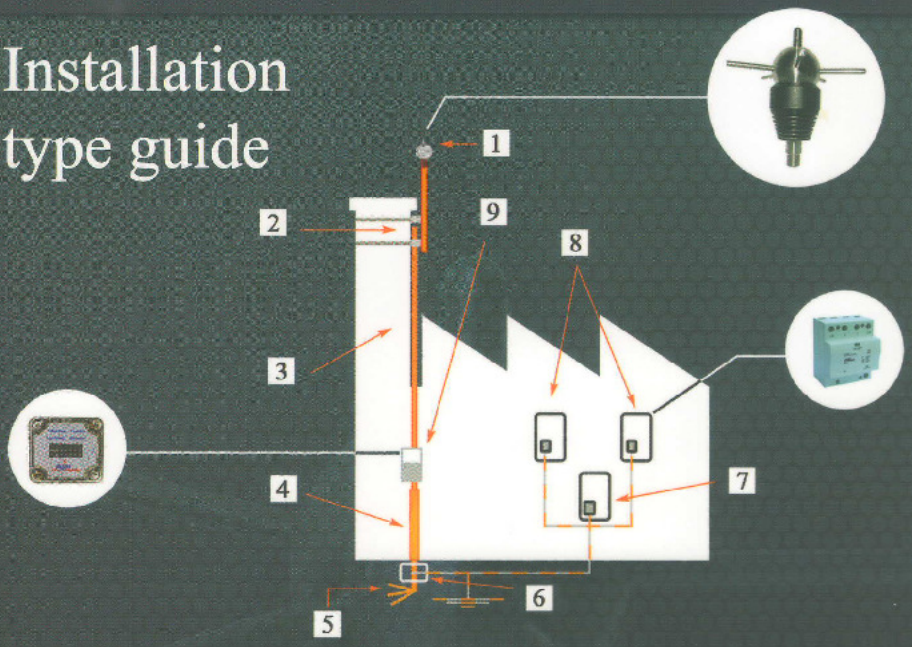
Installation type guide



1 *E.S.E. Air Terminal IONIFLASH MACH®*
2 *Fastening of Air Terminal*
3 *Down conductor and fasteners*
4 *Inspection joint and protection sheath*
5 *Earth rods system*
6 *Disconnecting connection between earthes (Electric earth and Air Terminal earth) in inspection pit.*
7 *Surge arrester Type 1 to Main Power supply network (associated to Air Terminal)*
8 *Surge arrester Type 2 to Secondary Power supply network*
9 *Impulse lightning counter*

Radius of protection

The radius of protection (Rp) of an E.S.E. air-terminal depends on its height (h) in relation to the surface to be protected, its early streamer emission time (Δt) and the level of protection (Lp) chosen.

$Rp = \sqrt{h(2D-h)+\Delta L(2D+\Delta L)}$ for h≥5m

For h<5m, the graphic method is used, with the abacuses of the NF C 17-102 standard.

Rp = protection radius.

h = height of the tip of the E.S.E. air-terminal in relation to the horizontal point passing through the top of the element to be protected.

D = 20m for protection level I
30m for protection level II
45m for protection level III
60m for protection level IV

V = Average velocity of propagation of the streamer (1 m/µs)

ΔL(m) = V(m/µs) . ΔT(µs)

ΔT = early streamer time from the evaluation tests of the E.S.E. air-terminal.

High	RADIUS OF PROTECTION OF THE AIR TERMINALS IONIFLASH MACH® 30 / 45 / 60 (m) [1]			
h (m)	Level I [2]	Level II [2]	Level III [2]	Level IV [2]
2	32	34	40	44
3	48	52	59	65
4	65	68	78	86
5	79	86	97	107
6	79	87	97	107
8	79	87	98	108
10	79	88	99	109
20	80	89	102	113
30	For those high,	90	104	116
45	an additional graphical study enables		105	119
60	to determine the protection volume of the air-terminal			120

(1) If there is a risk for environment, the radius of protection must be reduced to 40 % according to the interpretation sheet F5 (2006) of the NF C 17-102 standard.

(2) The protection level is determined up to UTE C 17-108 guide according to interpretation sheet F4 of the NF C 17-102 standard, or up to NF EN 62305-2 standard.