

IONIFLASH *MACH*[®] NG TF

EARLY STREAMER EMISSION AIR TERMINAL

REMOTE TESTING



FRANCE[®]
PAR ATONNERRES


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THE IONIFLASH MACH® NG TF

THE TECHNOLOGY

The air terminal rod **IONIFLASH MACH® NG TF** includes the last scientific works in Laboratory and in situ for providing a permanent and reliable solution, a higher efficiency with patent protection.

The efficiency results of the **IONIFLASH MACH® NG TF** with a **very low standard deviation confirm the stability and the security of its protection radius.**

The spherical tip of the **IONIFLASH MACH® NG TF** and the design of the sphere increase and regulate considerably the ionization, initial factor of the early streamer process, by activating the propagation of the upward leader.

Indeed, for a particular level of electromagnetic field, the sharp tips produce too many charges. These charges gathered at the top of the air terminal rod reduce drastically the lightning attachment process compared to an air terminal rod with spherical tip.

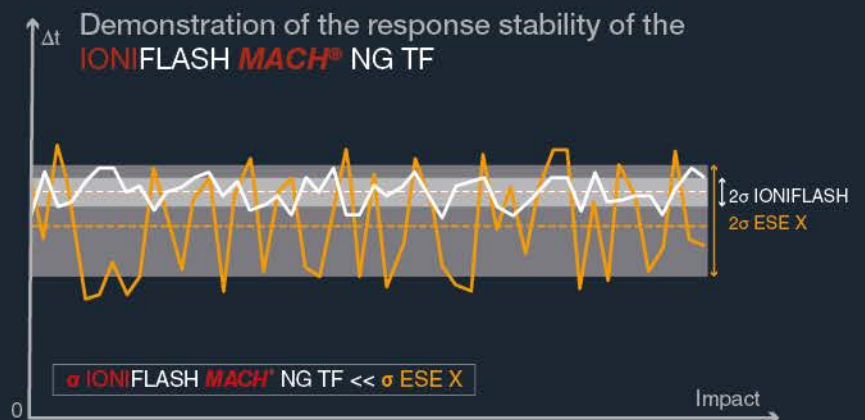
STANDARD DEVIATION RATIO

The standard deviation of the ESEAT **IONIFLASH MACH® NG TF** (white curve) is more efficient than the standard deviations of the other ESEATs with sharp tip (yellow curve) in the same conditions.

The standard requires a standard deviation ratio to be under 0.8 and the lowest possible between an ESEAT and a simple rod. The more the ratio will be low the more the response and the protection of the ESEAT will be stable and reliable

Value of the standard deviation of the **IONIFLASH MACH® NG 60 TF $\sigma = 0,28$**

The standard deviation of the **IONIFLASH MACH® NG TF** presents exceptional performances (see technical data sheet) :



Δt **IONIFLASH MACH® NG TF** Δt ESE X

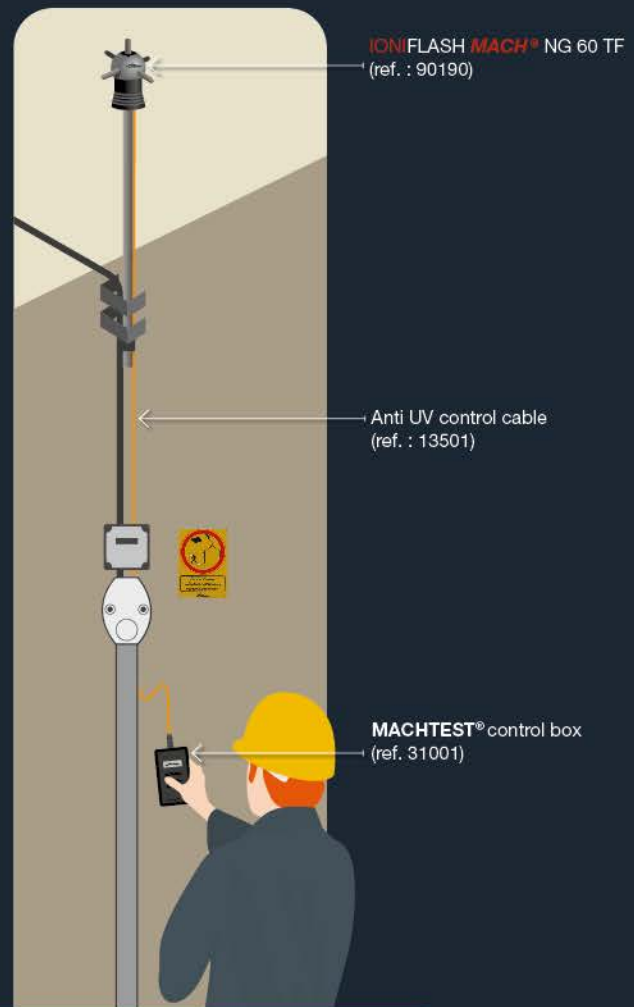
The **IONIFLASH MACH®** NG TF is a durable air terminal with technology already protecting 35 000 sites all over the world.

Proposed in remote testing option, **IONIFLASH MACH®** NG TF is controllable at distance with a total reliability with its cable solution.

PRINCIPLE OF THE TEST SYSTEM :

IONIFLASH MACH® NG TF is a remote testing Early Streamer Emission Air Terminal (ESEAT) with a total reliability thanks to its cable device :

- The cable continuously connected to the ESEAT allows a direct communication.
- For the control of the functioning of the ESEAT, from the ground or the roof, the MACHTEST® control box is connected to the cable.
- With the connection of the MACHTEST®, the control procedure starts automatically.
- At the end of the sequence, the result of the test is directly available on the MACHTEST® control box avoiding all risks of misinterpretation and lack of visibility.
- At the en of the test, the MACHTEST® is disconnected and stored (no elements exposure).



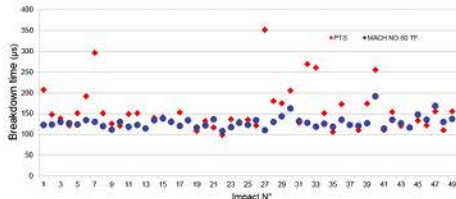
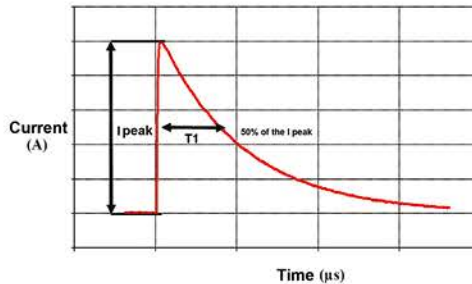
RELIABILITY OF THE IONIFLASH MACH® NG TF

- Electrical and physical continuity from the IONIFLASH® tip to the earth
- Reliable and autonomous device even in extreme climatic conditions
- Double security thanks to the two spark gaps dimensioned to have an operating range adapted to the frequential spectrum of the lightning (0 to 10MHz).
- Fast and easy installation thanks to its dimensions and light weight: 2.3 kg.
- Support tools for study and installation (IONEXPERT 3000®).
Operational test devices MACHTEST®, impulse counter IONICOUNT®).

THE HIGHEST LEVEL OF CERTIFICATION

TESTS OF THE IONIFLASH *MACH*[®] NG TF IN LABORATORY

The technology *IONIFLASH MACH*[®] has passed all the tests in accordance with the last edition 2011 of the NFC 17102 Standard Annex C. All these tests were done on a same sample in independent laboratories.

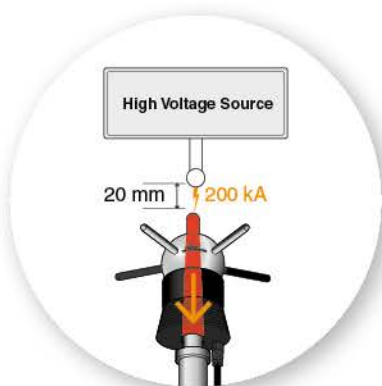


GENERAL TESTS	Documentary information and identification ↓ Marking tests
MECHANICAL TESTS	Inspection of the dimensional characteristics
ENVIRONMENTAL TESTS	Salt mist treatment ↓ Humid sulphurous atmosphere treatment
ELECTRICAL TESTS	Withstand voltage to impacts
EFFICIENCY TESTS	Experimental assembly ↓ Recording of the climatic parameters ↓ Measure of the efficiency

Tested in accordance to the Standards NFC 17-102 ed. 2011, UNE 21186, NP 4426, EC 62305, EN 62561, IEC 60060-1, manufactured according to Standard ISO 9001: 2015

SEVERITY TEST BEYON THE STANDARDS:

Much more severe additional tests such as effectiveness of the early streamer emission in rain conditions and resistance to much higher lightning currents demonstrate the robustness of the *IONIFLASH MACH*[®] technology.



Current test at 200 kA (waveform 10/350µs according to IEC 62561 protocole)

ESEAT subjected to 3 impacts with air gap of 20mm with peak current of 200 kA and energy generated up to 10 MJ/ohm.

With its reinforced structure, the *IONIFLASH MACH*[®] NG TF resists to impacts much higher than the one required by the standard. The spherical tip has an upper resistance than a sharp tip.

Early streamer emission test in condition of heavy rain (according to IEC 60060-1)

The internal early streamer device is totally protected from the rain thanks to the watertightness of the *IONIFLASH MACH*[®] NG TF and its own design.

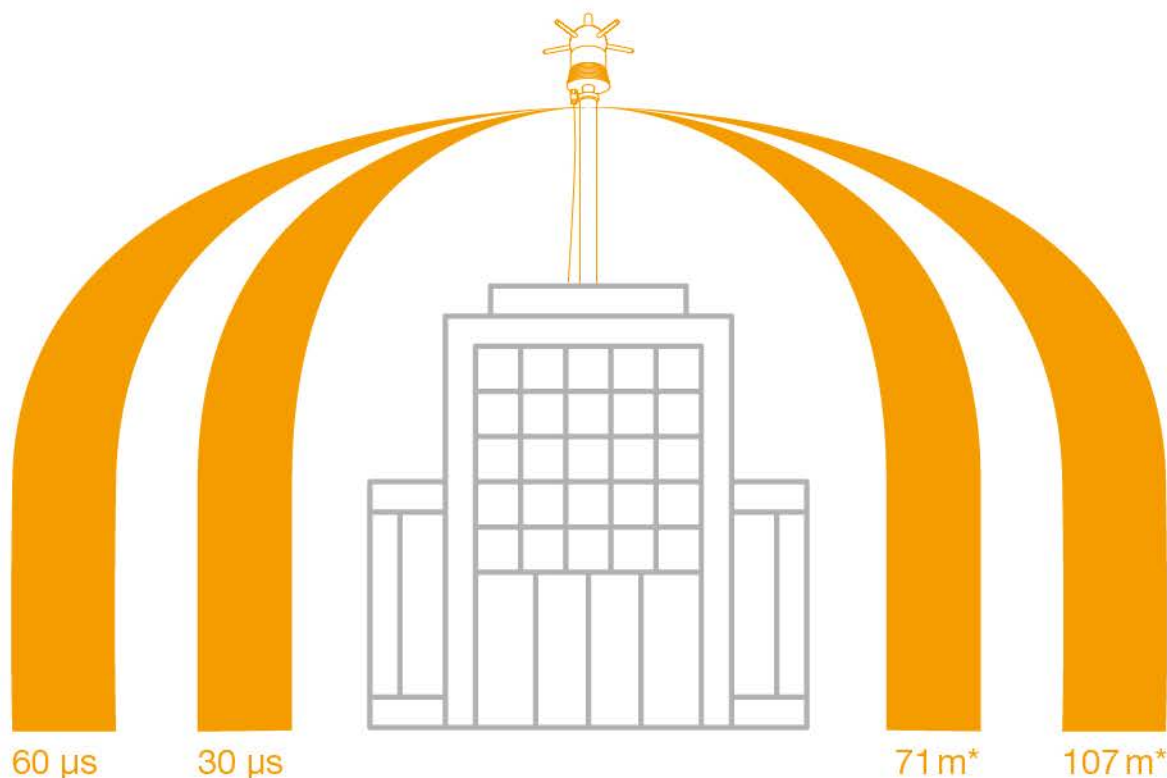
Insulation greater than 97%



STABILITY OF THE PROTECTION RADIUS

According to the NFC 17102/2011 art. 5.2.2., « an ESEAT is characterised by its ΔT efficiency, determined through evaluation test ». The ΔT maximum value allowed is $60\mu\text{s}$ even if the value of the results of the test is higher.

With the exceptional standard deviation of the ESEATs **IONIFLASH MACH[®] NG TF**, the protection radius here below have a greater stability :



*Example of the protection radius, at 5m under the tip, in protection level IV.

INSPECTIONS OF THE LIGHTNING PROTECTION SYSTEMS

According to IEC 62305-3, a complete verification imposes, as per the NF C 17-102 (2011), the following periodicities :

Level of protection	Visual inspection (year)	Complete inspection (year)	Complete inspection of the critical systems (year)
Level I and II	1	2	1
Level III and IV	2	4	1

OUR REFERENCES

40 YEARS OF EXPERIENCE : PRESTIGIOUS REFERENCES

More than 35 000 protected sites



Embry-Riddle
United States



Belem Tower
Portugal



Palais de Tokyo
France



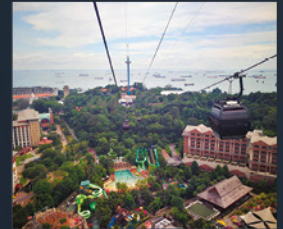
Solar field
France



Administrative center
Rumania



Radio Telescope
China



Sentosa cableway
stations - Singapore



Silver mine
Peru



San Agustin church
Ecuador



Water pump sta-
tion - RDC



Lukoil refinery
Bulgaria



Solar river
Lebanon



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MADE IN FRANCE

