



Lightning Protection

NEW 2019

**Early Streamer Emission (ESE)
Lightning Conductors**

**NF C 17 - 102
STANDARD TEST**

STANDARD TEST



Accredited Laboratory in the world for
NF C 17 - 102 standard tests.
ICMET CRAIOVA-Romania



Lightning current withstand Test and
Active lightning protection component
Blitzschutz & Emv
Technologiezentrum - Germany



FUNDACION PARA EL FOMENTO DE LA
INNOVACION INDUSTRIAL
UPM Technological Center-Tecnogetafe
C/ Eric Kandel, 1-28906 Getafe (Madrid)

CERTIFICATES

ISO 9001 : 2015
ISO 10002 : 2004
ISO 14001 : 2004
ISO 27001 : 2013
OHSAS 18001 : 2007



LSC

Lightning Strike Counter



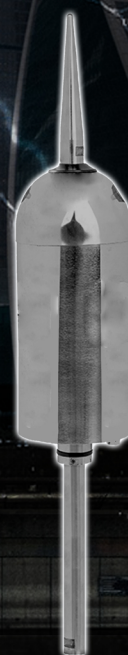
Forend Petex L



Forend Petex S



Forend EU



Forend EU-M

Early Streamer Emission Lightning Conductor

The principle of an early streamer emission lightning conductor is to artificially generate with the aid of an ionization mechanism, an early upward leader occurring before the other (natural) upward leaders, in order to establish a privileged impact point of the lightning strike.

FOREND E.S.E. Lightning Conductors

FOREND E.S.E. Lightning Conductor consists of 3 parts ; Air Terminals, Ion Generator and Roof Connection Mast. Air Terminal is produced of stainless steel or chromium plated copper and it has qualified diameter to resist high values of lightning currents. Ion Generator is located in a special section which is inside of stainless body and covered special resin from outer effects. As the atmospheric electric field increases during lightning storm, generator becomes active and ionizes surrounding air. The starting of ionization before lightning discharges is an important factor to keep the lightning stroke under control. All the lightning conductors of FOREND have ion accelerator structures to support ion generators. To increase the yield even more, supportive atmospheric electrodes are used during product design. These electrodes provides advantage for ionisation time, FOREND-PETEX-S which don't have these atmospheric electrodes, have shorter ionisation time than FOREND-PETEX. Roof Connection Mast is made of stainless steel or chromium plated copper as well. Mast size can be adjusted according to Client's demands.

Technical Specifications of FOREND E.S.E. Active Lightning Conductors

FOREND PETEX-L



Model: PETEX-L

Product: Early Streamer Emission
Lightning Conductors

Material: Stainless steel

Acc.to NFC-17 102 $\Delta T: 60 \mu s$

Weight = 2.3 kg

Height = 50 cm

FOREND PETEX-S



Model: PETEX-S

Product: Early Streamer Emission
Lightning Conductors

Material: Stainless steel

Acc.to NFC-17 102 $\Delta T: 30 \mu s$

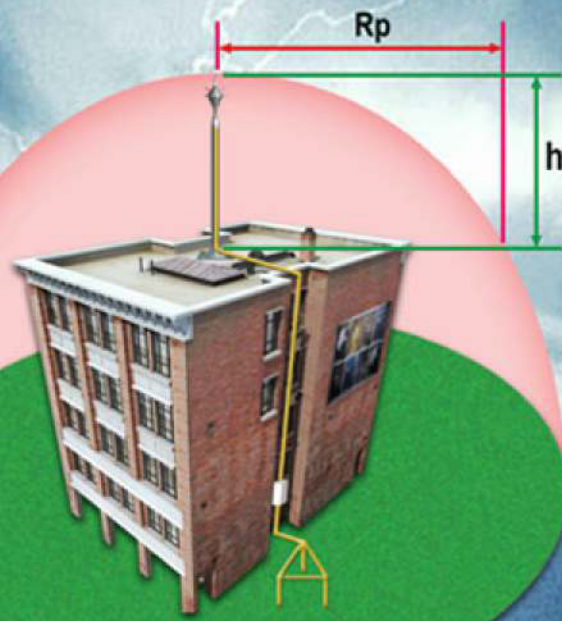
Weight = 2.2 kg

Height = 50 cm

Lightning Protection & Earthing Systems

NEW FOREND
2019

Protection Capacity Volume



The following formula is given in the French Standard NFC17102 concerning the protection Radius (Rp) for Active Lightning Conductors:

$$R_p = [h(2D-h) + \Delta L (2D + \Delta L)]^{1/2}$$

Here;

ΔL : Ion transmission path with ionization upon interaction of Active Lightning Conductor and lightning.

$$\Delta L(m) = V(m/\mu s) \cdot \Delta T(\mu s)$$

ΔT : Initiation advance time

D: Lightning impulse step according to the level of protection or globe radius according to rolling globe model. For different levels ;

For Protection Level I; D = 20 m

For Protection Level II; D = 30 m

For Protection Level III; D = 45 m

For Protection Level IV; D = 60 m

h: Distance between the end of Active Lightning Conductor and any lower point.

Note: The most effective h is the distance up to 6 m as shown in the table and figure.

	FOREND PETEX - S ($\Delta L=30m$)				FOREND PETEX - L ($\Delta L=60m$)			
Rp(m)	($\Delta T=30\mu s$)				($\Delta T=60\mu s$)			
h(m)	LEVEL I	LEVEL II	LEVEL III	LEVEL IV	LEVEL I	LEVEL II	LEVEL III	LEVEL IV
2	19	22	25	28	31	35	39	43
4	38	44	51	57	63	69	78	85
5	48	55	63	71	79	86	97	107
6	48	55	64	72	79	87	97	107
8	49	56	65	73	79	87	98	108
10	49	57	66	75	79	88	99	109
20	50	59	71	81	80	89	102	113
30	50	60	73	85	80	90	104	116
60	50	60	75	90	80	90	105	120

Lightning Protection

FOREND LSC (Lightning Strike Counter)

Description

The Lightning Strikes are detected and monitored by FOREND LSC, which is able to give some information about the service necessity of the Lightning Protection System. By using an inductive record, the counter is able accurately count all lightning events for a later reference.

Operating Principle

FOREND LSC works with an inductive effect of the lightning strike current. The events are monitored by a mechanical counter display. The counter includes a high frequency transformer.

Applications and Descriptions

- Produced according to IP 65
- Nonresetable
- Currents detected from 2 to 100 kA
- Mechanical Counter with 6 digits
- Easy mountable
- Does not require any external power supply
- Serial Counter
- Dimensions : 11.3 x 7 x 4.8 cm



FOREND L.C. Tester

Forend Active Lightning Conductors can be checked by Forend L.C. Tester any time. The tester will indicate OK or FAULT with the help of red or green LED. Its connection cable can be long up 100 meters.

Illuminated Warning System



LED Beacon Lights

- Special design red coloured UV resist glass cap,
- Aluminium body
- Produced according to IP 67
- High Bright 8x6 hexagonal LED illumination,
- 8 different operating function, with 2 different operating speed,
- Instant fault detection and warning,
- Instant day & night detection with photo-diode,
- Anticorrosive coated microprocessor based

	FSP-24	FSP-48	FSP-220
Power Supply	24 V AC/V DC	36-72 V AC/V DC	220 V AC
Power Consumption	3W		
Luminescence Intensity (typical)	32 cd		
Luminescence Intensity (max)	46 cd		
Height x Diameter (mm)	206 x 135		
Operating Temperature (°C)	- 40°C to +85°C		
Weight (kg)	1.5		



NEW FOREND
2019

LIGHTNING PROTECTION & EARTHING SYSTEMS

FOREND 19 Mayıs Mh. Büyükdere Cd. No:4 Basman Han
K:4 D:4 34360 Sisli - Istanbul / TURKEY
Phone: +90 212 291 51 63 Fax: +90 212 291 51 65



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28 Soi Rattanathibet 28 Yaek 2 Bangkrasor Muangnonthaburi Nonthaburi 11000 THAILAND
Tel : 02-965-7701-6, 02-527-3104-5, 086-355-6781 Line : 086-313-3492 Fax : 02-965-7707 Email : sales@up-t.com



PETEX-S

Model: PETEX-S
 Product: Early Streamer Emission
 Lightning Conductors
 Material: Stainless steel
 Acc.to NFC-17 102 $\Delta T: 30\mu s$
 Weight = 2.2 kg
 Height = 50 cm



PETEX-M

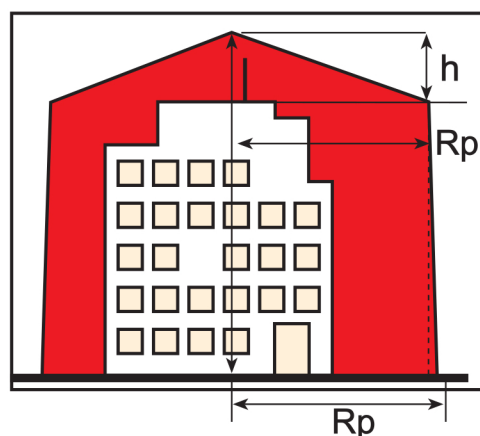
Model: PETEX-M
 Product: Early Streamer Emission
 Lightning Conductors
 Material: Stainless steel
 Acc.to NFC-17 102 $\Delta T: 45\mu s$
 Weight = 2.25 kg
 Height = 50 cm



PETEX-L

Model: PETEX-L
 Product: Early Streamer Emission
 Lightning Conductors
 Material: Stainless steel
 Acc.to NFC-17 102 $\Delta T: 60\mu s$
 Weight = 2.3 kg
 Height = 50 cm

PROTECTION CAPACITY VOLUME



As FOREND all E.S.E lightning conductors operate within the temperature range of (°C) = - 40° to + 120° and they are manufactured according IP 65

PROTECTION CAPACITY VOLUME

Rp(m)	FOREND PETEX-S ($\Delta L=30m$)				FOREND PETEX-M ($\Delta L=45m$)				FOREND PETEX-L ($\Delta L=60m$)			
	($\Delta T=30\mu s$)				($\Delta T=45\mu s$)				($\Delta T=60\mu s$)			
h(m)	Level I	Level II	Level III	Level IV	Level I	Level II	Level III	Level IV	Level I	Level II	Level III	Level IV
2	19	22	25	28	25	28	32	36	31	35	39	43
4	38	44	51	57	51	57	64	72	63	69	78	85
5	48	55	63	71	63	71	81	89	79	86	97	107
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30	50	60	73	85	65	75	89	101	80	90	104	116
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