LİVA ACTIVE LIGHTNING RODS

2. ACTIVE CAPTURING SYSTEMS

ACTIVE LIGHTNING CONDUCTOR

Because of the above-mentioned disadvantages of those lightning protection systems of cage method and simple capturing rod, alternative systems of lightning protection are preferred more, today. One of those alternatives is the Active Lightning Conductor.
Our company has 7 different types of product, in this scope. Six of these products are designed to function in accordance with the principle of "Early Streamer Emission (ESE)," and the other lightning conductor method is designed both to work in accordance with the principle of "Early Streamer Emission" and the "Piezo Crystallized Emission System."

LIVA ACTIVE LIGHTNING RODS

A. The Lightning Rods Working with Early Streamer Emission (ESE)

1. LİVA "LAP-DX 250 Active Lightning Rod (ESE)
2. LİVA "LAP-AX 210 Active Lightning Rod (ESE)
3. LİVA "LAP-BX 175 Active Lightning Rod (ESE)
4. LİVA "LAP-BX 125 Active Lightning Rod (ESE)
5. LİVA "LAP-CX 070 Active Lightning Rod (ESE)
6. LİVA "LAP-CX 040 Active Lightning Rod (ESE)

B. Early Streamer Emission System (ESE) and Piezo Crystallized Lightning Rod:

7. LİVA "LAP-PEX 220 Active Lightning Rod" (ESE+ Piezo Crystallized)
You can find below detailed information about the lightning conductors that we produce, which work with Early Streamer Emission System (ESE). You will also find information about our Piezo Crystallized Lightning Rods in the following pages.

A. The Lightning Rods that Work with Early Streamer Emission System (ESE)

MATERIAL: The metal components of the conductor rod, which will carry the lightning, are produced of stainless steel (Inox) to resist against chemical interactions and corrosion. This feature of the lightning rod allows it to remain strong and durable against heavy elements of the nature.

WORKING SYSTEM: Electro Atmospheric Field Effective Liva Active Lightning Rod, which works in accordance with the principle of Early Streamer Emission System (ESE), obtains its energy from the density changes between electrostatic and electromagnetic fieds.
The lightning rods have four main components:

1. Capture Terminal
2. Body; (a) Ionic Tunnel (b) Energy Block
3. Bottom Mil
4. Conductor Connection Adaptor

TESTS AND DOCUMENTS

We present below the tests and certificates we have obtained with regards to Liva Active Lightning Rods. (*)

A. The Standard Strike Voltage Test: The Lightning Rod has been tested at the High Voltage Laboratories of the Middle East Technical University (METU) Department of Electrics and Electronics. The lightning strike value was tested between 1020 and 1675 kV (+) Positive and (-) Negative and was considered to be appropriate.

B. Lightning Rod Strike Voltage Jumping Time (Δt) Test:

1. The Lightning Rod Strike Voltage Jumping Time (Early Streamer Warning) (Δt) was applied to the Lightning Rod at NFC 17-102 (Appendix C) standarts at METU Department of Electrics and Electronics and the certificate of approval to relevant standarts was obtained for the Lightnig Rod.

2. Strike Voltage Jumping Time (Early Flow Warning) (Δt) Test was applied to the Lightning Rod at IEC 61083-1, IEC 60060-1 and NFC 17-102 (Appendix C) standards at CNAS (Ilac-MRA) Laboratories, which has International Accredation Certificate, and it was documented to be in conformance with the relevant standards.

C. Lightning Rod Strike Voltage Heavy Current Strike (Short Circuit kA) Test:

1. The Lightning Rod was tested with 25kA current strikes at High Voltage Laboratories of the METU Department of Electrics and Electronics, and it was certified that no change or deterioration took place in its qualities.

2. The Lightning Rod went through tests with 115kA current strikes at TS EN 50164-1 Standards at SIGMA Testing Laboratories, which certified that no change or deterioration took place in its qualities.

D. Temperature Test (-40 °C ile +120 °C) was applied to the Lightning Rod at Accredited Laboratories, which proved that no deterioration happened in its operation at these temperatures.

E. The Lightning Rod went through "Protection Test against Reaching Unsafe Parts and Solid Bodies, and Water Resistance Test" at TS 3033 EN 60529 standards at Laboratories accredited by European Co-operation for Accreditation (EA) and International Laboratory Accredetation Cooperation (ILAC). As a result of the tests, its conformity with relevant criteria was licensed.

F. Gost Document: The Lightning Rod has "GOST" Document

G. CE Certificate: The Lightning Rod has received "CE" Conformity to Europe document.

H.Warranty Period: The Lightning Rod has "30-Year Warranty" Document.

LİVA ACTIVE LIGHTNING RODS

B. Early Streamer Emission System (ESE) and Piezo Crystallized Lightning Rod:

MATERIAL: The metal components of the conductor rod, which will carry the lightning, are produced of stainless steel (Inox) to resist against chemical interactions and corrosion. This feature of the lightning rod allows it to remain strong and durable, just like the first day, against heavy elements of the nature.

OPERATION SYSTEM:
Electro Atmospheric Field and Wind Effective Liva Active Lightning Rod, which works in accordance with the principle of Early Streamer Emission System (ESE) and Piezo Crystallized Emission System, obtains its energy from the density changes between electrostatic and electromagnetic fieds in the air, and making use of the dynamic energy of the wind.

1. Capture Terminal
2. Wind Wings
3. Body;
   (a) Energy Block
   (b) Piezo Crystals and related equipment
4. Bottom Mil
5. Conductor Rod Connection Adaptor

TESTS AND DOCUMENTS

You can find below the tests that Liva Active Lightning Rods underwent.

Lightning Surge Voltage By-Passing Time (Δt) Test: Lightning Surge Voltage By-Passing (Early Streamer Warning) Time(Δt) Test at NFC 17-102 (Appendix C) was applied to the Lightning Rod at the High Voltage Laboratories of the Middle East Technical University (METU) Department of Electrics and Electronics. The tests proved that the Lightning Rod is in conformity with the relevant standards.

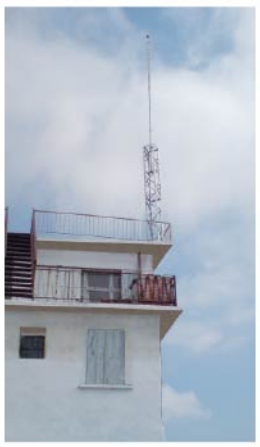
Gost Document: The Lightning Rod has "GOST" Document.
CE Certificate: The Lightning Rod has received "CE" Conformity to Europe document.

Warranty Period: The Lightning Rod has "30-Year Warranty" Document.

You can also find detailed information about our Active Lightning Rods on our website www.livaparatoner.com

TABLE OF LIVA LIGHTNING RODS PROTECTION LEVELS

Protection Level	LEVEL- 1							LEVEL- 2							LEVEL- 3							LEVEL- 4						
Type of Capture Rod	LAP-AX 210	LAP-BX 175	LAP-BX 125	LAP-CX 070	LAP-CX 040	LAP-DX 250	LAP-PEX 220	LAP-AX 210	LAP-BX 175	LAP-BX 125	LAP-CX 070	LAP-CX 040	LAP-DX 250	LAP-PEX 220	LAP-AX 210	LAP-BX 175	LAP-BX 125	LAP-CX 070	LAP-CX 040	LAP-DX 250	LAP-PEX 220	LAP-AX 210	LAP-BX 175	LAP-BX 125	LAP-CX 070	LAP-CX 040	LAP-DX 250	LAP-PEX 220
Height of the Pole (m)	Radius of Protection Area (m)							Radius of Protection Area (m)							Radius of Protection Area (m)							Radius of Protection Area (m)						
4	100	81	58	48	39	115	155	108	89	65	55	45	123	164	120	100	74	64	53	134	176	130	110	83	72	60	146	188
5	100	82	58	49	39	115	155	109	90	65	56	46	124	164	121	100	75	65	54	135	177	131	110	84	72	61	146	188
6	101	82	58	49	40	115	155	109	90	66	56	46	124	164	121	101	76	65	54	135	177	131	111	84	73	62	146	188
8	102	82	59	50	40	115	156	110	90	66	57	47	124	165	122	101	77	66	56	136	177	132	111	85	75	63	147	189
10	102	82	59	50	41	116	156	110	91	67	58	48	124	165	122	102	77	67	57	137	178	133	112	87	76	65	148	190
15	102	83	60	51	42	116	156	111	92	68	59	50	125	165	123	104	80	70	60	138	178	135	114	89	79	69	149	191
20	102	83	60	51	42	116	156	112	92	69	60	51	126	166	125	105	81	72	62	139	179	136	116	92	82	72	151	192

LİVA ACTIVE LIGHTNING RODS

LAP-CX 070

LAP-CX 070

PHYSICAL PROPERTIES OF THE DEVICE

Order code	Size	Package Size	Δt Early Streamer Warning Time (according to NFC 17 – 102 standards) (*)	Protection Radius (according to NFC 17 – 102 standards) (**)			
				Level 1	Level 2	Level 3	Level 4
LAP-CX 070	Length: 70 cm Net weight : 2.40 kg Gross weight: 3.10 kg	13x13x70 cm	31 µsec.	49	56	65	73

LAP-CX 040

LAP-CX 040

PHYSICAL PROPERTIES OF THE DEVICE

Order code	Size	Package Size	Δt Early Streamer Warning Time (according to NFC 17 – 102 standards) (*)	Protection Radius (according to NFC 17 – 102 standards) (**)			
				Level 1	Level 2	Level 3	Level 4
LAP-CX 040	Length: 70 cm Net weight:2.30 kg Gross weight: 2.90 kg	13x13x70 cm	22 µsn	40	46	54	62

(*) Δt value shows the early streamer time advantage that a lightning rod (ESE lightning rod, for instance) has in arresting the lightning, compared to an ordinary capture terminal (S.R.). Bigger Δt value means that the active reaction of the lightning rod is better. It shows that it can attract the lightning to itself at a higher point, at a larger protection diameter and fastly.)

(**) It involves the situation that the lightning rod is mounted at least 6 m. higher than tha highest point of the building to be protected, with the help of the lightning pole. The protection diameter is calculated by taking into account the approximate early streamer warning time.