株式会社 落雷抑制システムズ
Lightning Suppression Systems

There is nothing good about inviting lightning strike.

It is better minimize lightning strike.

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Distribute
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Lightning Suppression Systems
Matsumoto Ken

Company profile

株式会社 落雷抑制システムズ
Lightning Suppression Systems

【Location】
Yokohama Landmark Tower 4406
2-2-1Minato Mirai, Nishi-ku, Yokohama,Japan
【Year of incorporation】March,2010
【Capital】 25,000,000 yen
【Company policy】
Protecting society from lightning strike.
【Number of Intellectual Property】
We have about 120 intellectual property registered related to lightning strike.

If you don't touch the gods, they won't curse you.
It must be better not to invite lightning strike.
Our company aims to contribute to society by "suppressing lightning" strike.

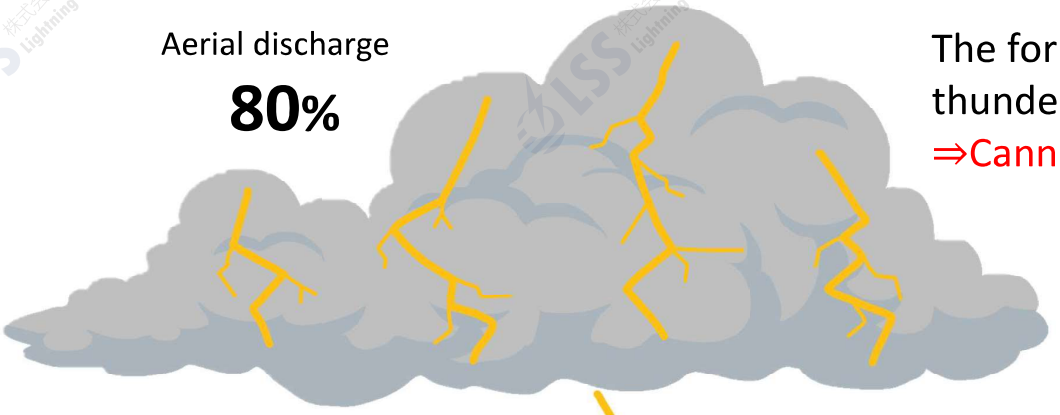

PDCE-Magnum


ALB


PDCE-Junior

1
The need for a PDCE

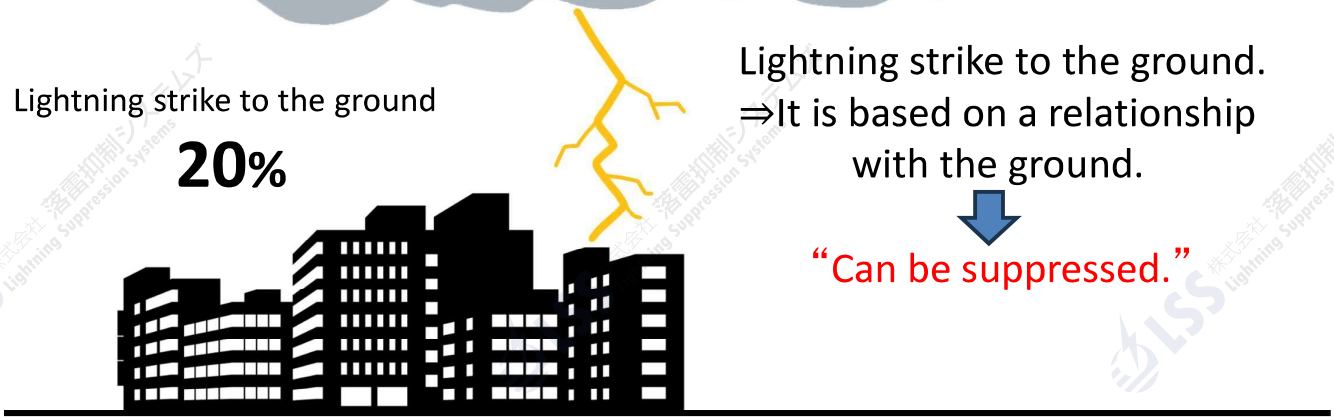
The principle of lightning strikes



Aerial discharge

80%

The formation of thunderclouds.
⇒Cannot be prevented.



Lightning strike to the ground

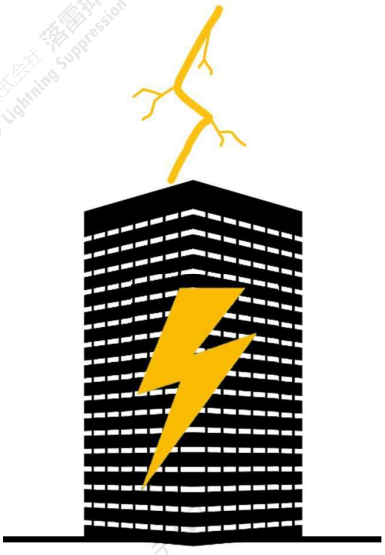
20%

Lightning strike to the ground.
⇒It is based on a relationship with the ground.

“Can be suppressed.”

Types of lightning damage

Direct strake

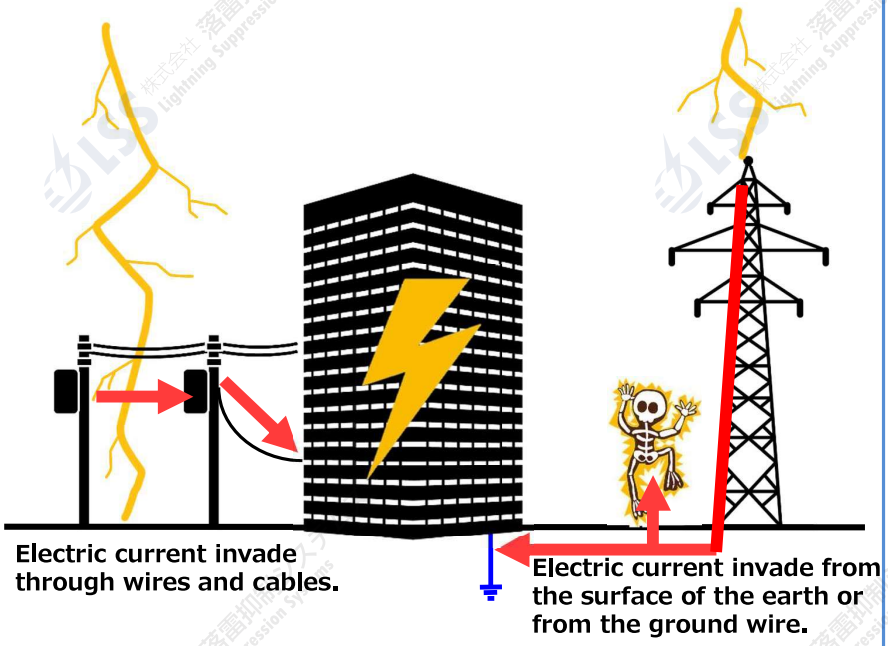


Hit

We can prevent by ALB.

Induced lightning

Backflow current



Electric current invade through wires and cables.

Electric current invade from the surface of the earth or from the ground wire.

They can be protected with anti-surge items.E.g.,SPD.

What is PDCE?

Traditional air-termination system

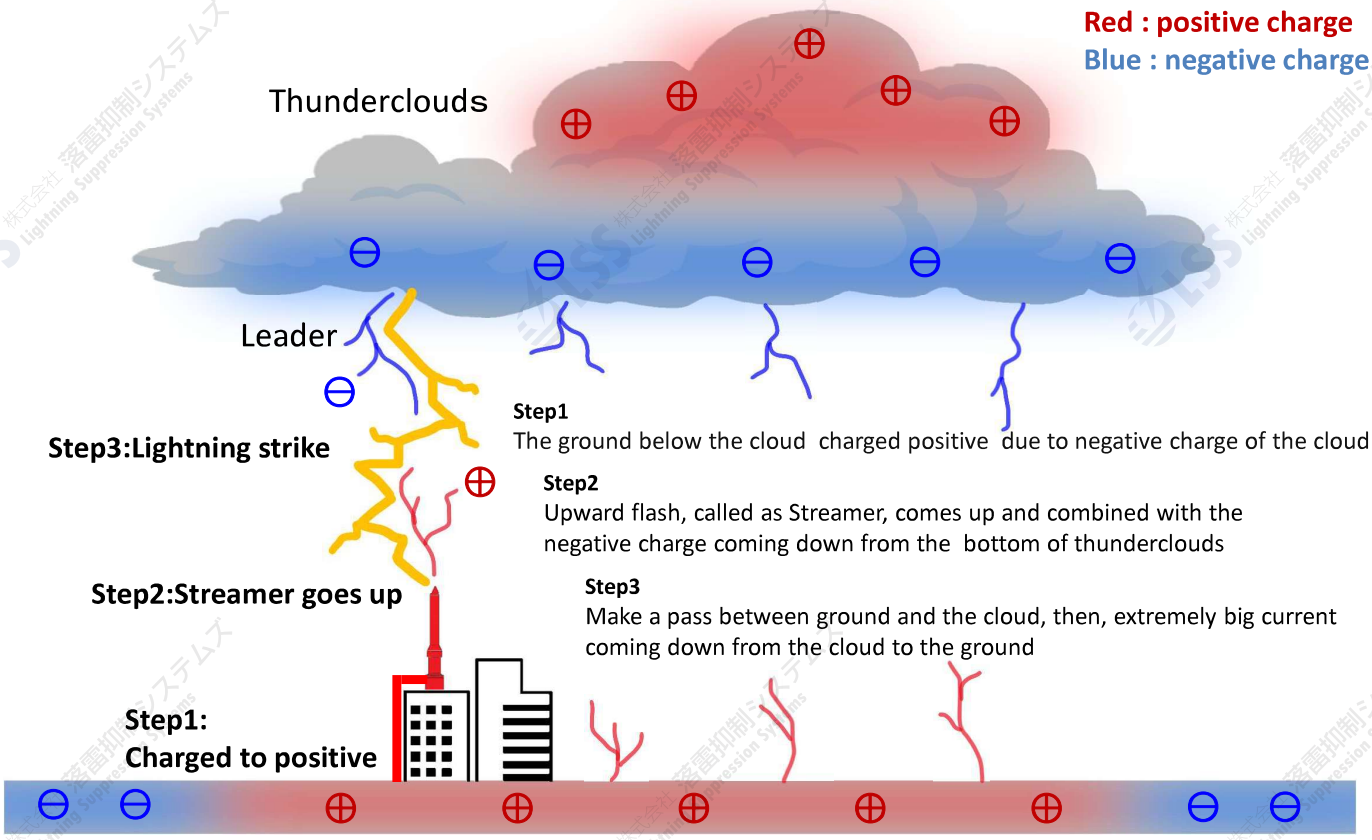
+ Function not to invite lightning. =

ALB

In addition to the function as **a traditional air-termination system** such as Franclin rods, it has added the function **not to invite lightning**.

Prevent damage caused by lightning current.

Principle of lightning strikes



If it is sharp, it is easy to discharge(Corona discharge)

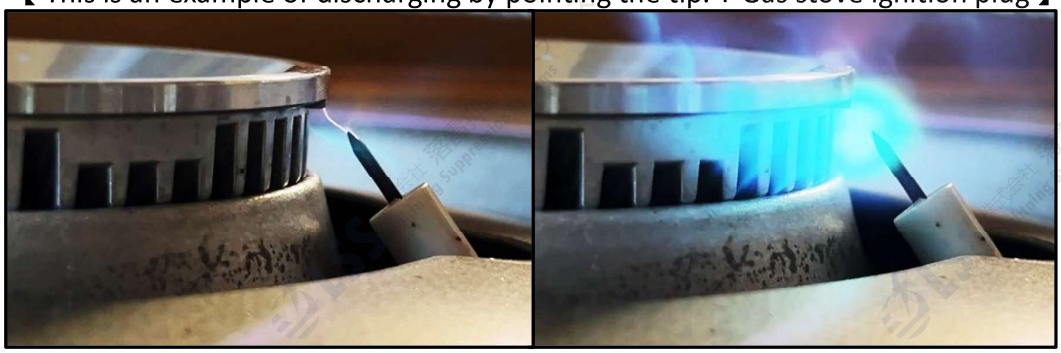
The tip of pointed objects have a higher electric field strength, making them more prone to discharge.

Direction of discharge Ground to the air above

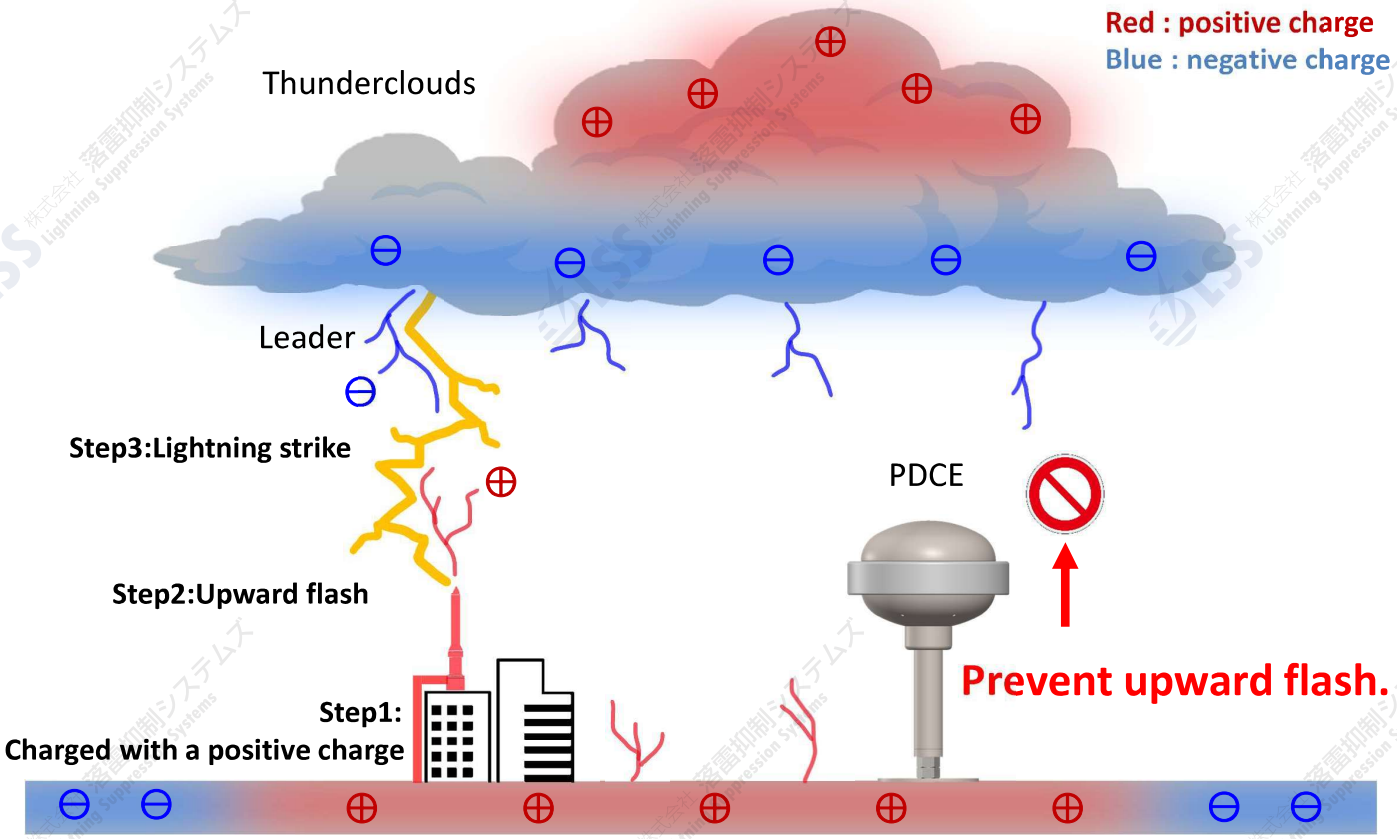
It combines with the discharge from the cloud【Leader】to form a discharge path and attract the charge from the thunderclouds.

Franclin rods are inviting lightning.

【This is an example of discharging by pointing the tip. : Gas stove ignition plug】

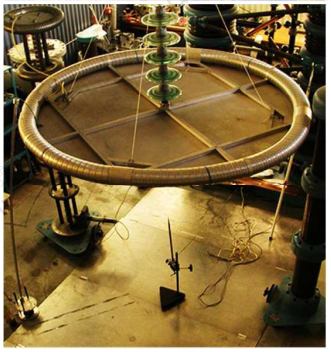


Principle of the lightning strike suppression effect of PDCE.

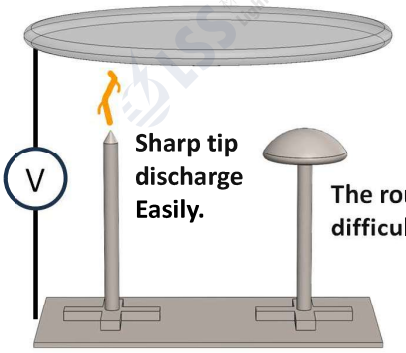


"Sphere" shape that suppresses pick-up discharge

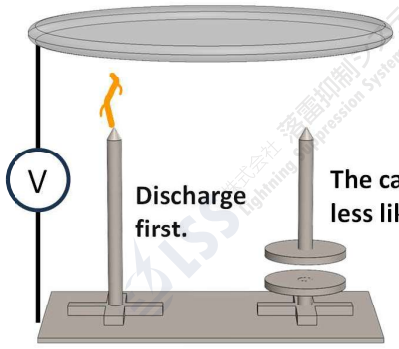
《 Discharge test facility》

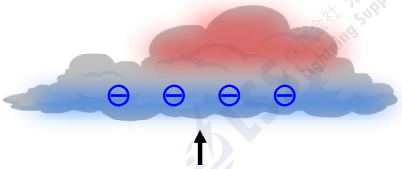


【 1. Shape of the electrodes 】



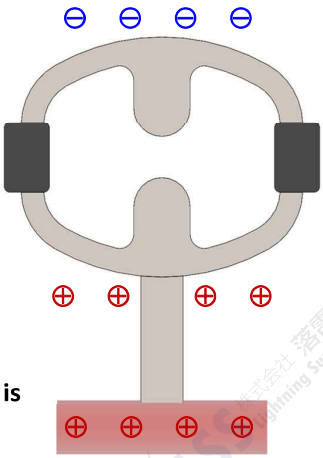
【2. Capacitor structure 】





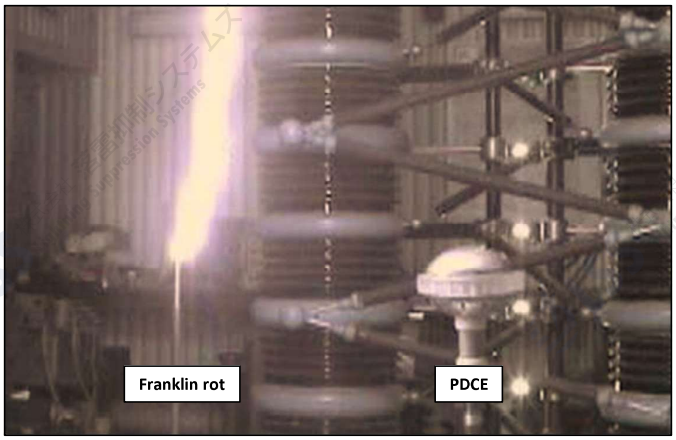
Both have a negative charge, so they do not attract each other.

Fusion



Round shape electrodes with capacitor structure inside do not invite lightning hit .

Evidence by experiments



【 Verification by discharge test 】

Discharge test based on French standard (NF-C17) at the University of Pau in France.

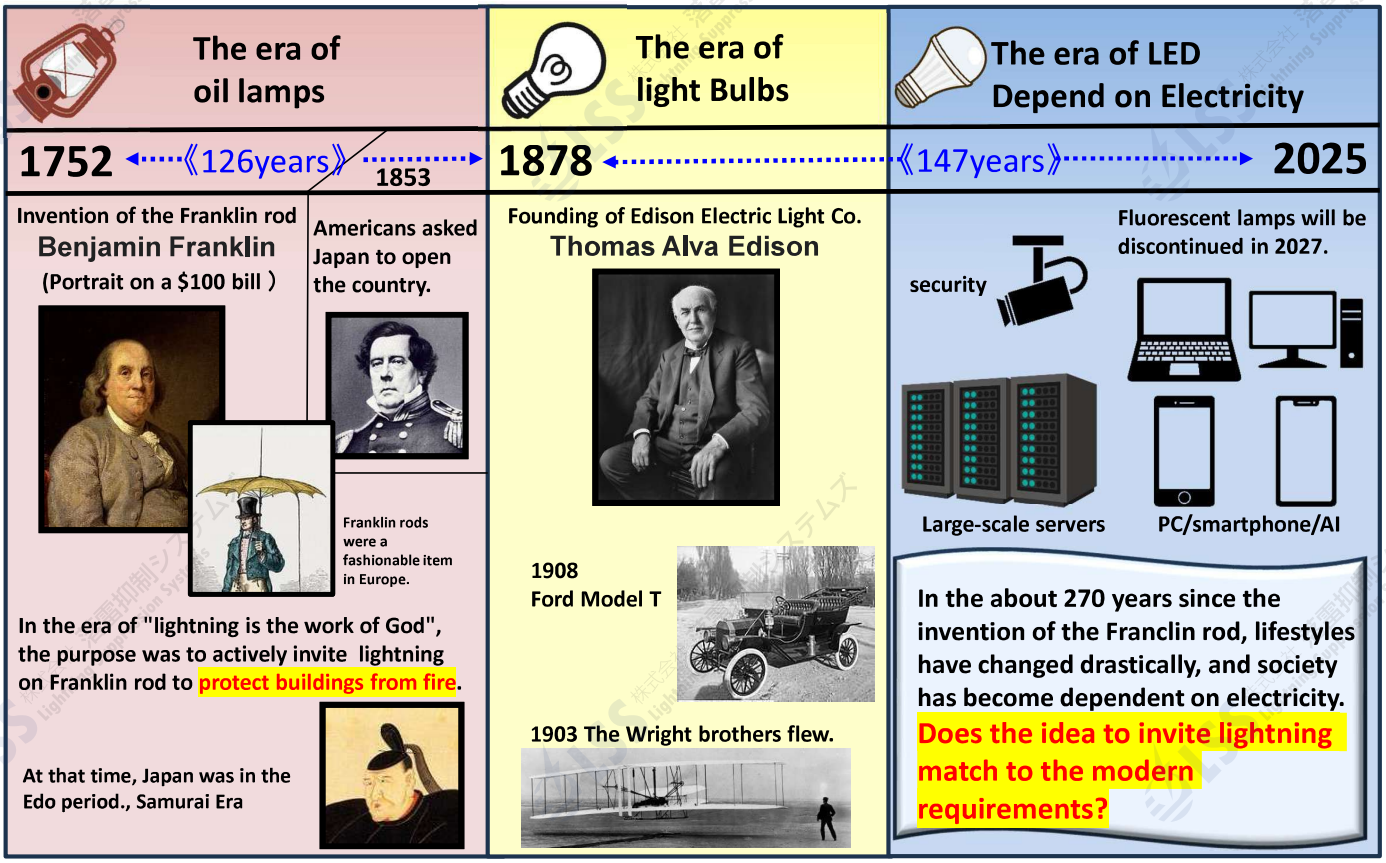
Both Franklin rod and PDCE under the same voltage , only the Franclin rod discharge.

【Verification in the natural environment】

A five-year comparative experiment at Fukaura, Aomori Prefecture, Japan, in which Franklin rod and PDCE were in same height with 1m separation horizontally at the top of 92 meter high tower.

The result was 11 times lightning hit on Franklin rods, while ZERO hit on PDCE

History of Franclin rods　Is a 273-year-old Franklin rod fit the times?



Problems with conventional Franclin rod

Problems so far

◆ **Electric current received by lightning rod does not necessary go deep into the Earth.**
◆ Lightning current which conduct the surface of the ground often destroy electric devices on the ground.
◆ Even if Franklin rod catch the lightning strike, the lightning current simply flow on the surface of the ground and cause people's damage there

Problems ahead

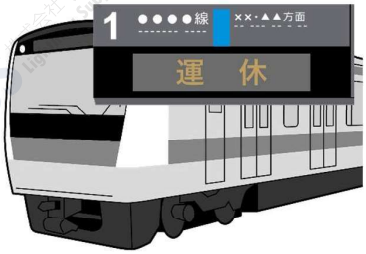
◆ Due to global warming, **the number and power of lightning strikes are increasing.**
◆ Society is depending more on technologies, which are incompatible with lightning.

The countermeasure against direct strake has NO change in the past 270-years,　inviting lightning to lightning rod.

→ Even if you wear contemporary　fine suit, you keep on putting　on same footwear　as some 270 years ago.

It is important NOT to receive the Lightning

Lightning protection measures from the perspective of BCP



The cost of repairing equipment < **Impact of equipment outages**

Direct strake is powerful enough to carbonize equipment.

◆Industrial equipment take time for recovery, and replacements are not easy

◆ In addition to financial damage for repair, opportunity loss cost more than repair

◆ Emergency power generator do not necessary function as you expect if you lost switching device breaks down first.

【Insurance companies are not charities】

→ The first time, they will pay silently.

→ The second time, there may be refuse to underwrite insurance in some cases.

There are still many natural disasters such as earthquakes and typhoons that cannot be prevented.

But lightning strikes can be suppressed!

Conclusion

【 Until now 】

Guide line to protect buildings.

Induced lightning currents cause trouble.

＜Future countermeasures＞

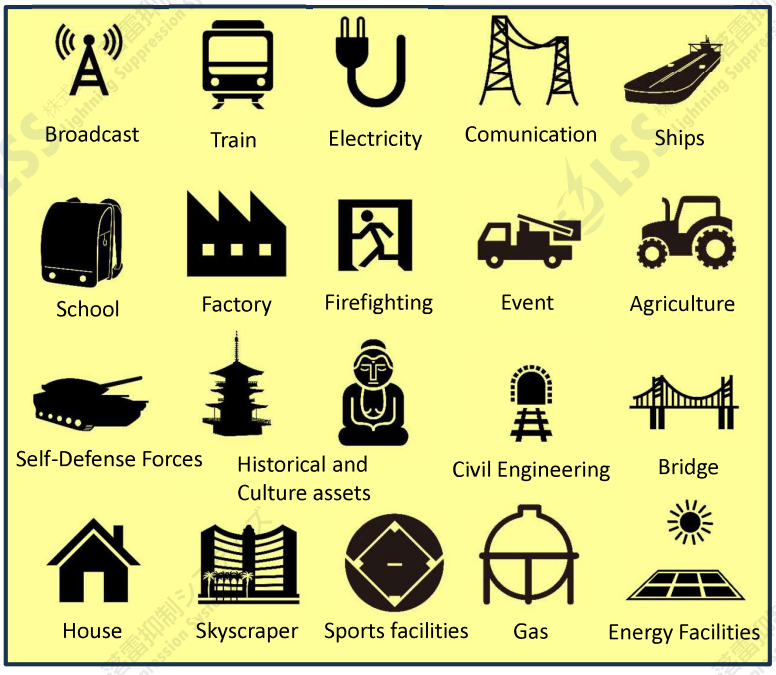
✖ **Invite lightning strikes**

○ **Don't invite lightning**

Let sleeping dogs lie.

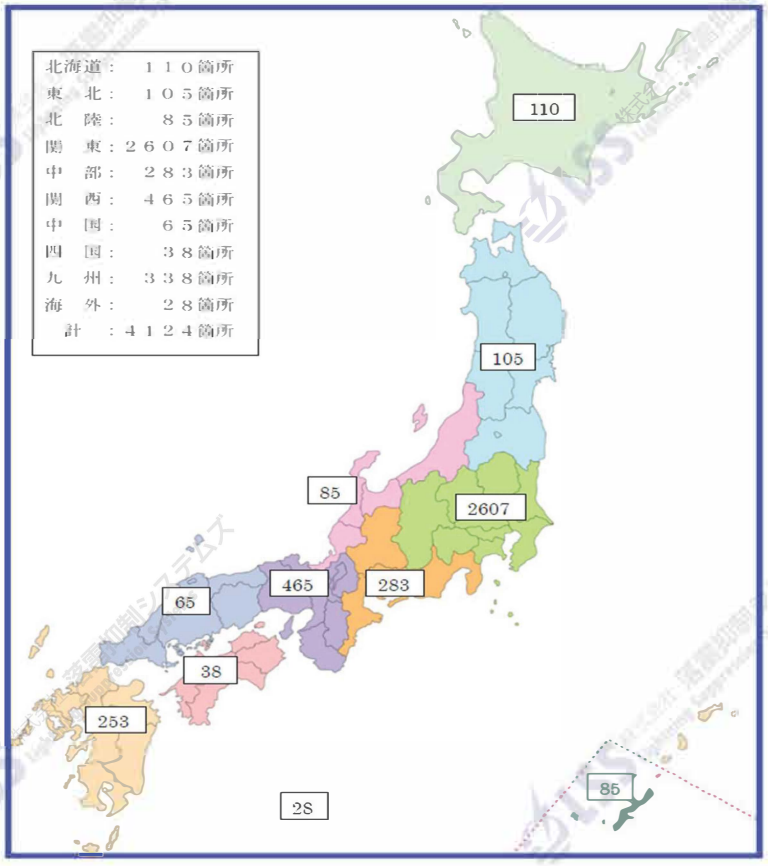
【 From now 】

Suppressing lightning strikes, mainly to protect electrical equipment.



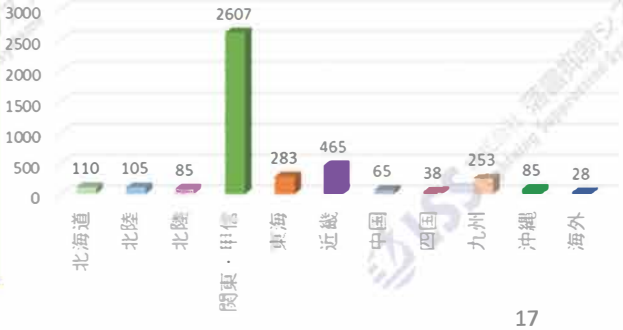
2
Case Studies

Delivery record in Japan　　It exceeded 4,300 units.

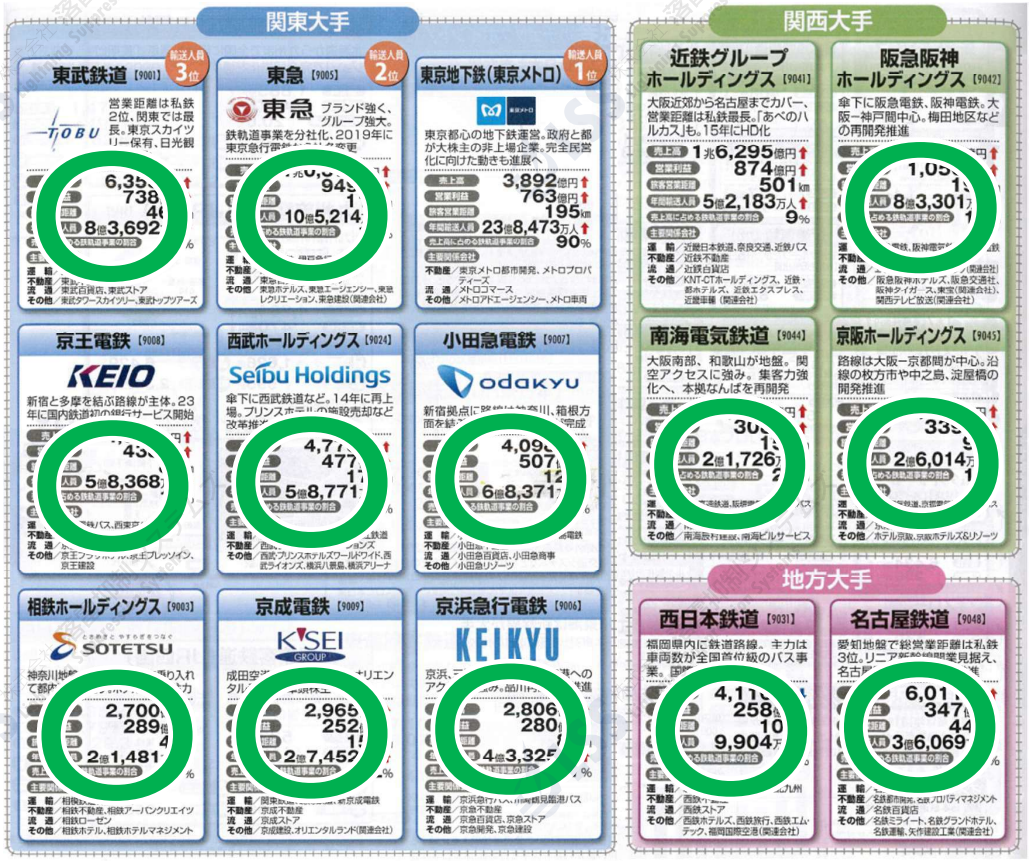


2013　200units
2014　450units
2015　700units
2016 1062units (10/31)
2017 1582units (12/30)
2018 1920units (12/30)
2019 2201units (11/30)
2020 2706units (10/30)
2021 3058units (09/30)
2022 3448units (12/31)
2023 3703units (12/31)
2024 4124unit (12/27)
2025 4300units (04/27)

Delivery Region



Notable achievements 15 major private railway companies.



(Source)
Kaisha Shikihou
Industry Map 2025
Toyo Keizai Inc.

【Other】
Tsukuba Express
Tokyo Monorail
Tama Toshi Monorail Line
Enoshima Electric Railway
Hakone Ropeway
Sanyo Electric Railway
Central Japan Railway

We introduce case studies on our website

Customer's voice It is posted on the website.

It is difficult to quantify the effectiveness of PDCE, such as how many lightning strikes it has prevented, given that this is a natural phenomenon that occurs by chance. However, it is a fact that lightning strikes that occurred before the introduction of PDCE have disappeared since its introduction.

By KEIOH Railway

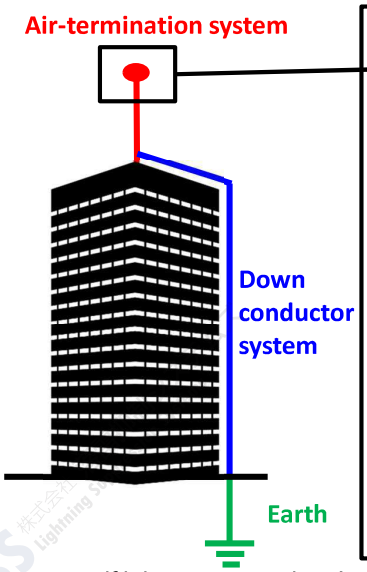
Our first PDCE was the Ushiku Daibutsu, the world's largest bronze statue. Since its construction in 1993, the 120m bronze statue has been struck by lightning about once every three years. Its beautiful appearance has not changed, but in 2010, a large lightning strike caused serious damage to the electronic equipment and elevators inside, which prompted us to consider introducing PDCE.

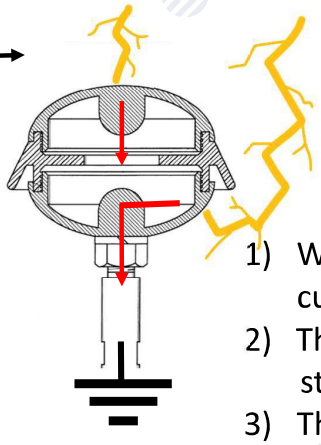
3

How to get started

It conforms to the air-termination system part of the Building Codes in Japan

Purpose: Safely diffuse lightning currents to the ground when struck by lightning.
Lightning protection System consist of Air-termination ,Down conductor, Earthing





If lightning strike PDCE
Most are struck by lightning on the lower electrode. Even if lightning strikes the upper electrode, the current flows to the lower electrode due to the internal air gap.

1) When a PDCE is struck by lightning, a lightning current flow to the ground.
2) The material and its thickness conform to JIS standards.
3) This product is the lightning receiving part of the lightning protection system.
Grounding work is mandatory.

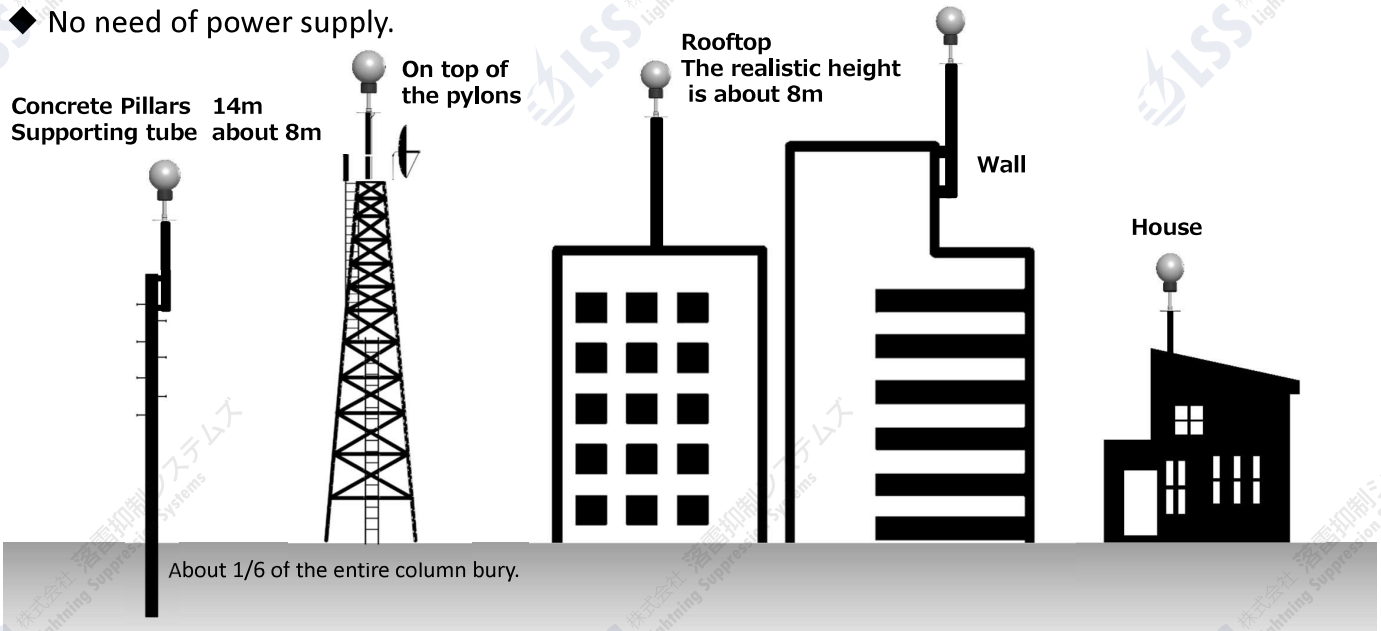
Q. Even if it is not a protrusion shape, is it good as an air-termination system?
A. If the air-termination system satisfies the material and thickness of JIS, the handrail will also be air-termination system. In addition, in the IEC standard on which JIS is based, it is called Lightning Rod or Franklin Rod, Air Termination System, and there is no concept in the original text that expresses functions and shapes such as "lightning protection" and "needle", so it does not need to be a protruding needle shape.

Installation location

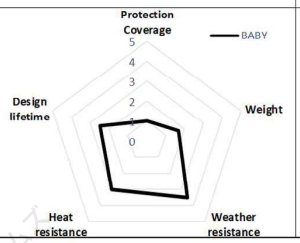
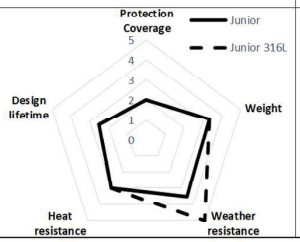
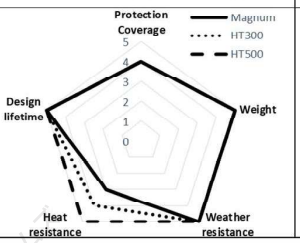
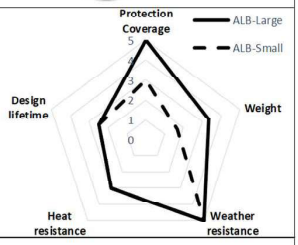
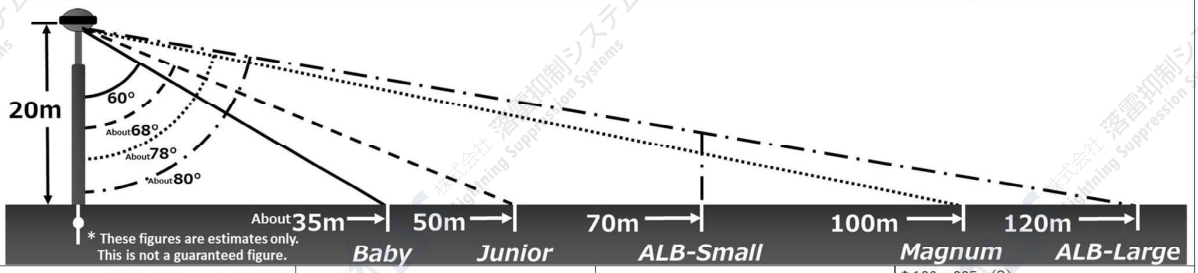
Installation strategy

Replace traditional Franclin rods with PDCE.

- Install it at **the highest position** in or near the building you want to protect from lightning strike.
- Grounding is always necessary.
- No need of power supply.



PDCE Product Lineup

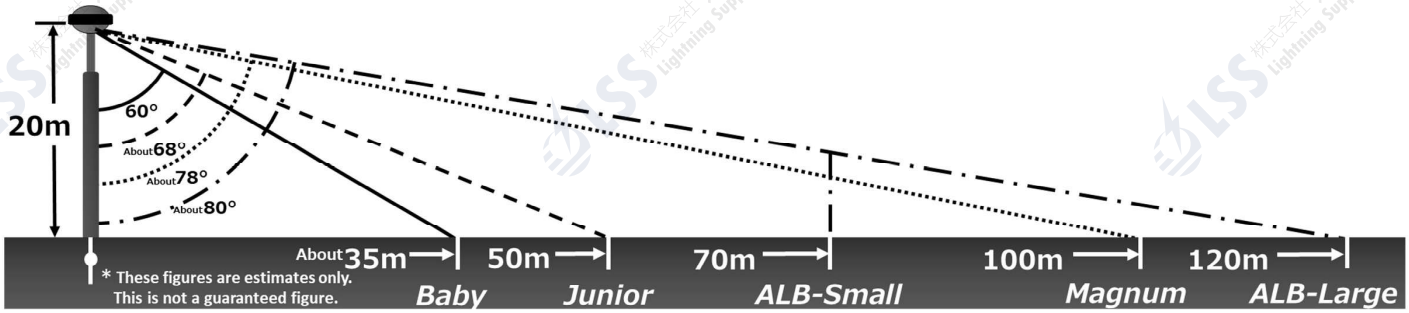
	The most convenient Llightweight and compact	Easy to use and the most popular PDCE	High performance and durability 14 years of history	Double structure 3D capacitor Shut out upward flash
Series	Baby Series	Junior Series	Magnum Series	ALB Series
機種	PDCE-Baby	PDCE-Junior PDCE-Junior 316L	PDCE-Magnum HT300 / HT500	ALB-Large ALB-Small
Product Introduction				
Radar chart ※Evaluation results within the company				
Range of protection (In cases not subject to the Building Standards Act) ※This is an estimate. It is not a guaranteed figure.				
Dimensions (DiameterxHeight)	φ120 X 235	φ200× 325	Φ240×395	Φ120 x 235 (S) Φ200 x 390 (L)
Weight	about 2kg	about 6kg	about 9kg	2.2kg (S) 5.5kg(L)

◆ You can choose between the 'Marine' version, which has enhanced vibration countermeasures, and the 'EV model' featuring environmentally friendly colors. ◆ It does not require a power source.

PDCE Protection Coverage Figures derived from demonstration tests.

If it is necessary to apply the Building Standards Act：Installation within the protection range in accordance with JIS standards for lightning protection equipment.

If it were not necessary to apply the Building Standards Act：See the figure below.



***Caution**

If compliance with the Building Standards Act is required, the scope of protection provided by the PDCE demonstration test is not applicable.

It is necessary to consider and install the scope of protection in accordance with the Building Standards Act.

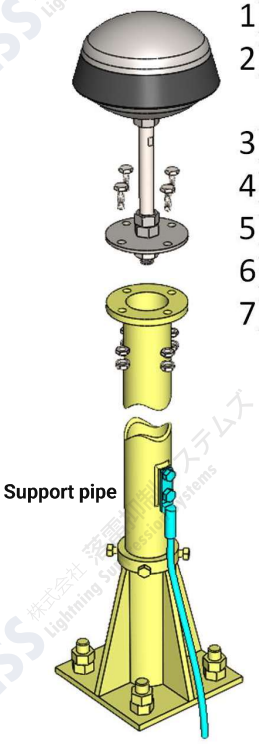
〈For example〉

Even if the maximum speed of a luxury sports car is 300 km/h, when driving on public roads, it is driven in accordance with the Road Traffic Law which has speed limit 50km/h.

The performance of the product and the law are two different things.

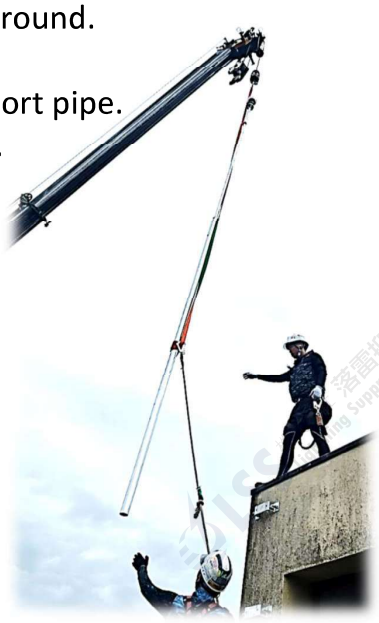
Installation

There are many installation methods, so please consult with a construction shop.



Installation flow(Common examples)

1) Site survey and design by contractors.
2) A contractor must prepare a support pipe with a flange that matches the mounting part of PDCE.
3) The old lightning rod should be removed by along with the support pipe
4) Attaching the PDCE to the support pipe on the ground.
5) Lifting with a crane, etc.
6) Bolts are used to fasten the building to the support pipe.
7) Connecting the pull conductor and the terminal.



Q. Is it necessary to remove the existing Franklin rod?
A. Remove any spike-type lightning rods that are not covered by the protection scope of the PDCE. In some cases, it will not be removed if it is within the range.

Q. If you want to use an existing support pipe
A. Welding work & anti-rust treatment is required to create a flange shape in the support pipe, so the support pipe must be prepared in advance.

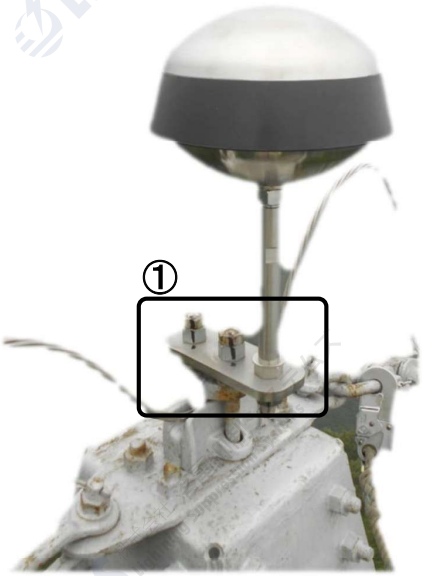
In addition, existing support pipes are often severely rusted, and it is recommended to replace them.

Many kind of options available to satisfy all of your needs

Each model can be specially accommodated as follows.(Extra charge)

① Flange Custom-made Sizes / Shape support.
② Flat-placed flange.
③ Anti-drop U-bolt. ALB has different type
④ Anti- vibration counter measures available as Marine type
⑤ Metallic luster can be removed

Standard Models



Strengths of Lightning Suppression Systems

Development, assembly, inventory, and shipment at a dedicated plant in Japan.

（株）落雷抑制プロダクツ

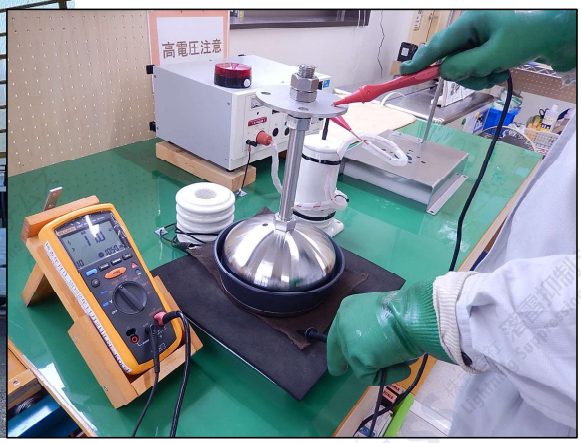
Lightning Suppression Products

Dedicated assembly plant for PDCE

【 location 】
Naka City, Ibaraki,Japan

【 Quality 】
ISO 9001
JIS Q 9001

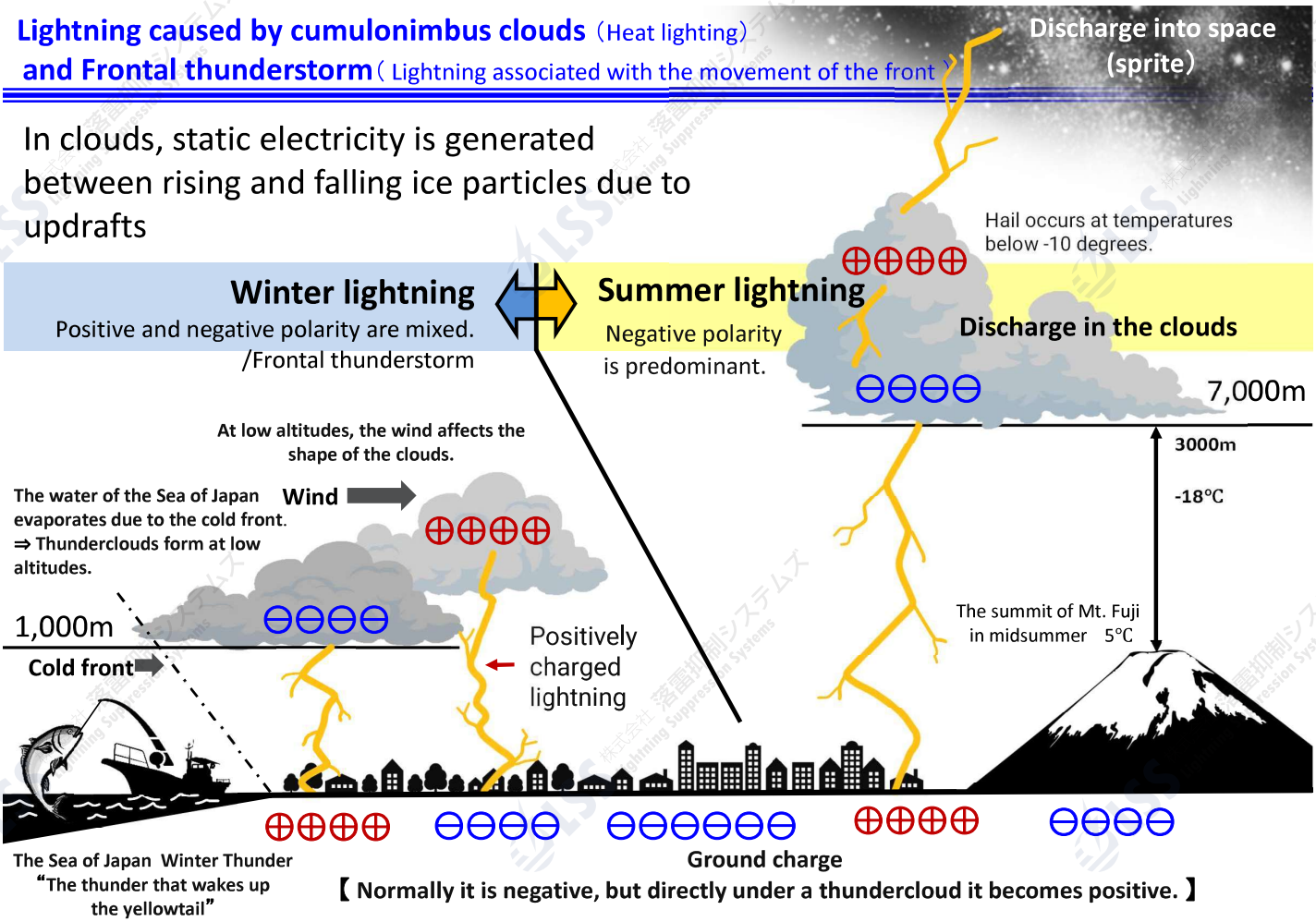
～ You can tour the factory.～



Reference material

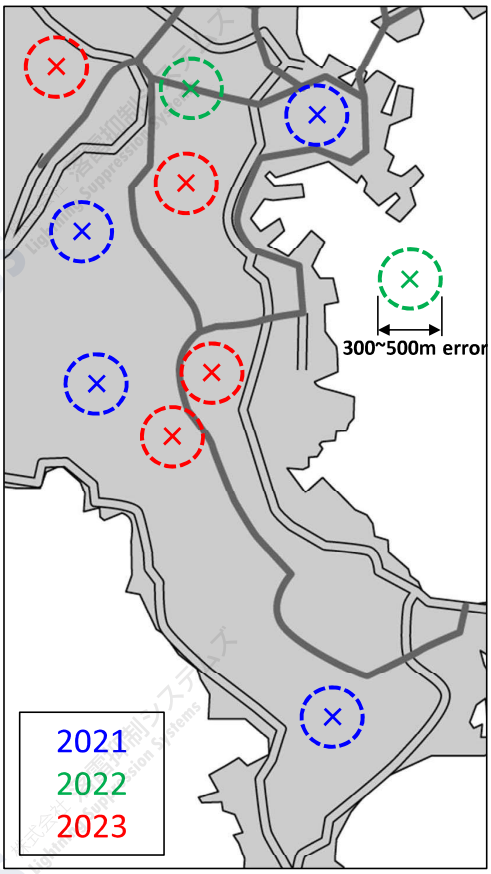
Lightning caused by cumulonimbus clouds（Heat lighting） and Frontal thunderstorm（ Lightning associated with the movement of the front ）

In clouds, static electricity is generated between rising and falling ice particles due to updrafts



Effects of PDCE

Is it possible to compare the data before and after use?



- ◆ Lightning strike do not always occur in the same location every year.
- ◆ We can't count the lightning that didn't strike.
- ◆ The positioning data of the lightning strike has measurement error of 300~500m.

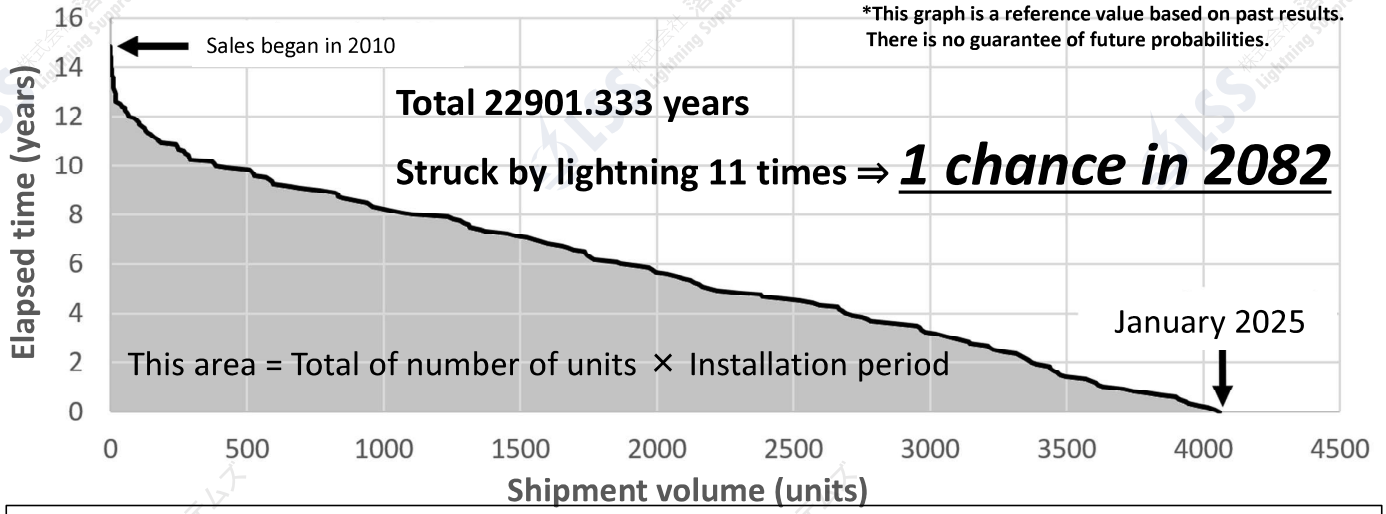
⇒It is **<u>difficult to compare positioning data academically</u>**

We can only recognize the exact location of a lightning strike by the presence or absence of damage to equipment.
→ Only the owner of the facility can compare the number of lightning strikes before and after the introduction.

"Customer's voice" is posted on our website.

Probability of being struck by lightning

Actual value since the start of sales.



【 Calculation method　It was assumed that the probability of a lightning strike was constant regardless of location 】

◆ If 1 unit is installed for 4 years and is struck by lightning once.

◆If 2 unit is installed for 2 years and is struck by lightning once.

◆If 4 unit is installed for 1 years and is struck by lightning once.

Installing 1 unit for 4 years is the same risk as installing 4 units for 1 year.

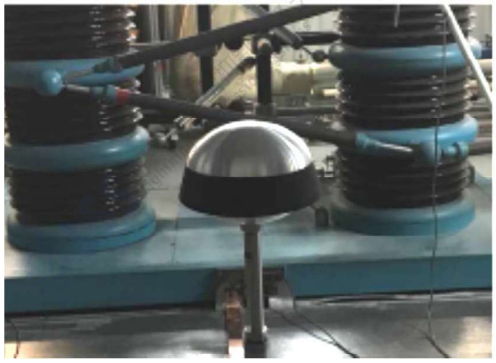
⇒ Total of number of units × Installation period / Number of lightning strikes requires the establishment of lightning strikes per vehicle.

PDCE Performance

The experiment at the University of Pau in France.

Franklin rod

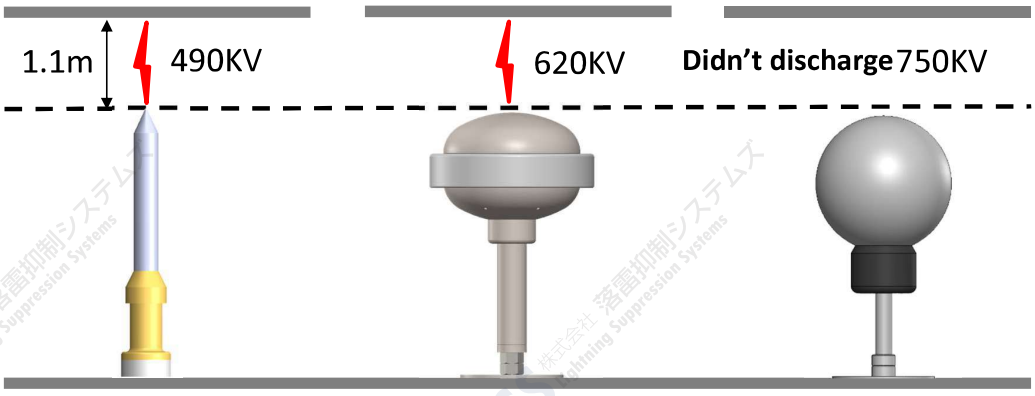
PDCE Junior



PDCE Super Magnum

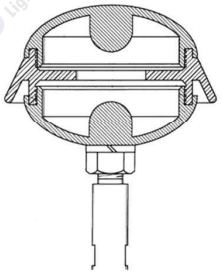
$<U_b>$ = 549.5 kV

$<U_b>$ = 549.5 kV



Various structures that suppress STREAMER. We are all patented.

Normal type PDCE

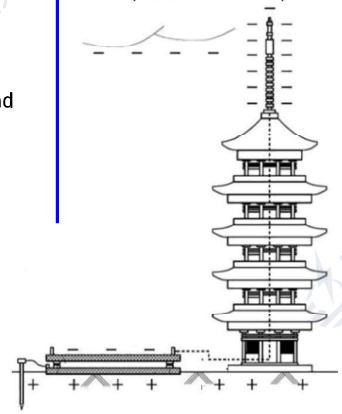


We have a track record of 4,100 units in Japan.

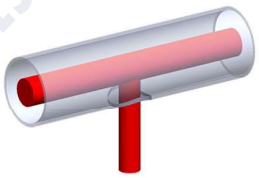
- Heat resistance 300℃~ 500℃
- Material
  Stainless（In Stock）
  Bronze for temples and shrines
  (Made-to-order)

Capacitive suppression device

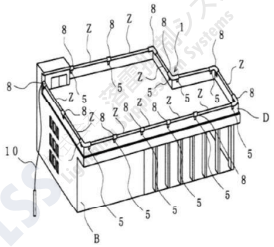
Five-storied pagodas, etc. While using a Franclin rod, Make it less susceptible to lightning strikes. (Made-to-order)



Horizontal type PDCE



It is placed around the rooftop of the building to prevent lightning strikes to high-rise buildings. (Made-to-order)

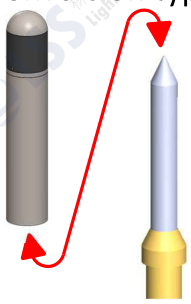


ALB

Further improvement of PDCE performance. The ultimate form of lightning suppression function.（In Stock）

〈Have a patent〉
Japan / USA / China / Europe

Franklin rods conversion type



By placing it on top of a conventional Franklin rod in use, it is converted to a suppression type at the installation site.（Made-to-order）

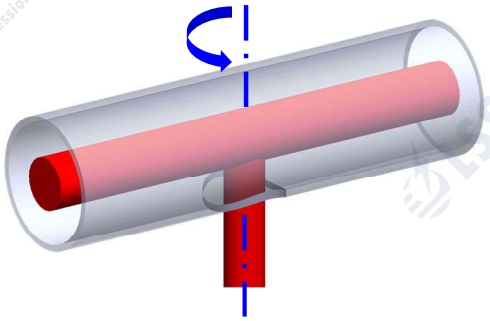
Wind power generation Wingtip type

(Made-to-order)

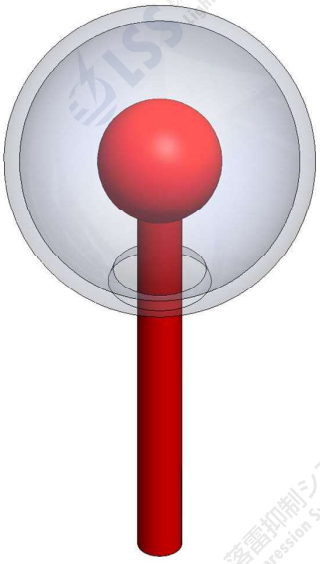
Latest Model Lightning Protection Ball Two Approaches.

Patented in Japan, the United States, Europe, and China

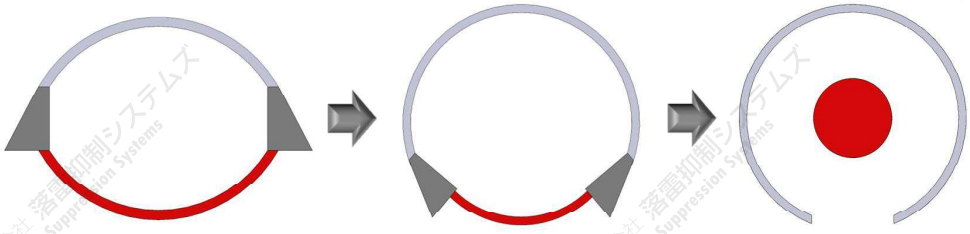
1. The coaxial structure is resistant to lightning strike.（Verified by discharge experiments）
   When rotated horizontally with respect to the vertical axis, it becomes a sphere.



Spherical PDCE



2. In order to prevent lightning strike on the lower electrode, it is deformed so that the upper electrode is greatly wrapped.



Genealogy of PDCE（PDCE：Pararrayos Desionnizador Carge Electrostatic）

INT
Principality of Andorra

Angel Rodriguez is the PDCE's Invented the archetype
⇒ Later, INT was sold.

Senior

Aluminum Cutting
Screw fastening

Right to sell

Sell the company

Dinnteco
Principality of Andorra

Dinnteco, which was a distributor of INT, acquired INT. They manufacture the products in Spain.

株式会社 落雷抑制システムズ
Lightning Suppression Systems

We have about 120 intellectual property such as patents, designs, and registered trademarks in Japan.
ALB is patented in Japan / USA / China / Europe.
Production is a JIS Q 9001 certified PDCE dedicated factory.

INT Dealership

Senior

Magnum

Bonding technology for upper and lower electrodes.
Stainless Steel Precision Casting.

Technology
Mr. Shiohata (current president of LSP)
Mr. Ishizaki (Former General Manager of LSS Technical Department)

2010~All models manufactured in Japan

Magnum

Heat-Resistant HT300/500

Exclusive model for the Tokyo Olympics PDCE 2020

Higher performance ALB

Lower costs Junior

Miniaturization Baby

For Harsh Environments

Super 316L

Why our customers choose LSS ?

株式会社 落雷抑制システムズ
Lightning Suppression Systems

1. Honest explanation without lying.

PDCE has a shorter history than conventional Franclin rods.
Some people explain hypotheses such as 'discharge slowly' or 'collecting charges from the air.'
However, that is questionable and can lead to misunderstandings about the products.
We only describe the facts confirmed by our experiments, and we do not use hypotheses that are close to fantasy to describe our products.
The fact that more than 4,300 units have been sold in the 15th year since the start of operations in Japan has proven that customers have been convinced to introduce the system.
Based on the customer's own experience, the number of repeaters who are convinced of the suppression effect and are increasing is increasing.

2. Overwhelming development capabilities.

We have obtained more than 50 domestic and international patents related to PECD.
We have 18 models that ranging high-temperature (Max 500°C) resistant PDCE and small/lightweight ones.
The world's first “PDCE" patented not only in Japan but also in the United States, China, and Europe will exhibit unprecedented overwhelming performance.

3. High-quality domestic assembly plant.

Our dedicated factory in Naka City, Ibaraki Prefecture, Japan, has acquired JIS Q 9001 and ISO 9001 certifications. We quickly respond to the detailed needs of our customers and support sales activities with sufficient inventory. We are the only professional manufacturer in Japan that consistently conducts everything from development to manufacturing.

If you have any questions about the contents, please check here.

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