

Lightning Protection

When Lightning Strikes

Packing 100 million to 1 billion volts of electricity and approximately 50,000°F, a bolt of lightning has the power to rip through roofs, explode walls of brick and concrete and ignite deadly fires. Most tragically, lightning kills.

The cost of lightning strikes to businesses is staggering. Corporations spend huge amounts of capital every year as a result of lightning damage to commercial properties. Insurance claims, destruction of equipment, fire damage and loss of production and inventory can all result from a single lightning strike or ensuing electrical surge. Most commercial buildings are vulnerable to lightning or surge damage (especially if there are several electrical service entrances). The use of metal building components is not required for lightning to be problematic, but their presence, as well as the costly hi-tech equipment housed in them adds to the loss potential. In addition to actual

property loss, lightning damage to robotics, communication lines and computer equipment can result in extended downtime for your corporation. Protecting people and property is what lightning protection systems are all about. Because every building's architecture is unique, a custom-designed lightning protection system will help meet a structure's specific needs. If not installed during the construction phase of a building, an existing building can be retrofitted with a lightning protection system.



Who Needs Protection?

Thunderstorms occur virtually everywhere and, therefore, place virtually every building at risk. The presence or absence of metal does not matter; rather, a structure's height, point shape, and isolation are the greatest determinates (mountains get struck all the time). State-of-the-art certified lightning protection systems are a part of the structural design of thousands of commercial and public facilities worldwide and are designed to maximize protection of life and property. Risk factors, including your location, frequency of thunderstorms, soil composition and building occupancy, determine the need for a lightning protection system. Another potential risk factor is the uniqueness or replaceability of the structure. Is it an important landmark like a government building, cathedral, historical site, museum, school or stadium? Structures more than 75 feet tall can be more susceptible to lightning strikes.

If you have specialized or sensitive electric or electronic equipment, you should consider lightning and surge protection equipment. We suggest that you consult with your power company or a certified lightning protection installer to assess potential risks in terms of life safety and property damage

The peak season for lightning is July through August, and lightning occurs most frequently in the late afternoon and early evening. According to the Insurance Information Institute (III), lightning accounts for nearly \$1 billion in insured homeowners' losses in the U.S. annually. III states that while the number of lightning strikes has decreased 7.5% per year since 2004, the average cost per claim has increased 142%. This increase is the result of the expanding use of electronics in homes and businesses. TV's, video games and computers are all susceptible to power surges when lightning hits nearby. The National Weather Service, states there are over 22 million lightning strikes per year.

To protect yourself and your property, follow the brief steps below:

1. **Assess your exposure.** The value of property at risk, the location, its uniqueness or significance and the frequency of lightning strikes need to be considered. Other concerns such as building height, soil composition, topography, occupancy of the building and any hazardous operations within the structure can all be factors. Determining the level of your risk to lightning strikes and damage can include the use of local power company resources and lightning installation professionals.

The [National Weather Service produces a map showing lightning strike frequency for the United States](#)

2. **Select a lightning protection system specific to your needs.** Lightning protection systems are designed to protect a structure and provide a specified path, preferably on the outside of the structure, to harness and safely ground the 100+ million volt lightning bolt. The system neither attracts nor repels a strike, but receives the strike and routes it harmlessly into the earth, thus discharging the dangerous electrical event. Investment in a lightning protection system will protect your property, belongings and equipment. The system should include air terminals (lightning rods), conductors, bonds, surge protection devices and ground terminals. Several organizations provide technical guidance and expertise for the design and installation of your lightning protection system (most notably, the non-profit [Lightning Protection Institute](#), who will provide names of certified designers and installers in your area). The system should be listed with Underwriters Labs (UL) and properly labeled.
3. **Install the system.** The system should be installed according to the design of professionals in accordance with an accepted standard, such as UL 96A *Installation Requirements for Lightning Protection Systems* or NFPA 780 *Standard for the Installation of Lightning Protection Systems*. Your installer should confirm that the installation will comply with or exceed the requirements of such standards.

Upon completion of the installation, be sure that all of the components in the design are installed securely. Loose wires, terminals and bonding hardware can become dislodged and whip around in high winds, damaging roof coverings, flashings, fascia and other building components. Ask your



In addition to building damage, there were 28 lightning fatalities in the United States in 2012:

See more Lightning Safety Tips at these links:

- [National Weather Service, www.noaa.gov](http://www.noaa.gov): "[When Thunder Roars, Go Indoors](#)"
- [NOAA Lightning Safety tips](#)

professional installer to demonstrate or explain all components and to provide technical documentation for the system.

4. **Inspect and Maintain your System.**

Lightning systems are located in areas of the structure with significant exposure to the elements. High winds, heavy rain, snow and temperature extremes can loosen fixtures and fittings, damaging the reliability of the system. It is important to have a regular inspection plan, along with a roof inspection plan, to ensure your lightning system is in proper working order.



The inspection plan should identify building deficiencies and verify that corrective action has been taken.

*Damage to roof membrane from loose and wind-blown lightning rod.
Source: Everest Loss Control Files*

Per NFPA 780, a lightning protection system should be inspected annually by a qualified contractor.

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