



Hardwood Manufacturers Association

665 Rodi Road, Suite 305, Pittsburgh, PA 15235 – 412-244-0440 – www.HMAmembers.org

Mother Nature can be full of surprises – How to stay grounded

Each year, thousands of buildings and properties in the United States are damaged or destroyed by lightning. This magnificent electrical discharge accounts for more than a quarter billion dollars in property damage annually, and is responsible for more deaths and property loss than tornadoes, hurricanes and floods combined. But of these violent forces of nature, lightning is one that business owners can economically afford to protect against.

Lightning is the visible discharge of static electricity within a cloud, between clouds, or between the earth and a cloud. Scientists still do not fully understand what causes lightning; however “ice inside a cloud is thought to be a key element in assisting in lightning formation.” Lightning-related losses have been noted to be the fourth highest frequency loss type experienced. But they are also one of the easiest loss forms to address.

How a Lightning Protection System Works

A lot has changed since 1752 when Benjamin Franklin first invented lightning rods. Yet while today’s systems have indeed evolved, Franklin’s brilliant concept has not changed. Lightning protection systems do not prevent lightning from striking but rather redirect it by providing a low resistance path for the energy discharge. Damage is prevented because the system provides a means for the static electricity discharge to enter or leave earth without passing through and damaging non-conducting parts of a structure, such as those made of wood, metal, brick, or concrete. And while some properties have a higher risk of lightning damage due to location and building construction features, the installation of a lightning protection system is certainly one way in which this natural loss occurrence can be controlled.

How to Protect Your Facilities

Parts of structures most likely to be struck by lightning are those that project above surrounding parts - chimneys, ventilators, dust collectors, cooling towers, water tanks, conveyor systems, railings, gables, ridges, and parapets. The edges and corners of flat or gently sloping roof areas are also most likely to be struck. Electronic equipment is also especially vulnerable. Lightning protection systems - air terminals (lightning rods) and associated fittings connected by heavy cables to grounding equipment - should be installed to keep up with methods of building construction, changing requirements and business technology. Surge arresters should be installed on electrical service panels, telephone equipment and other incoming lines as the first line of defense against harmful surges that may enter a structure through power lines. Arresters divert the surge to ground; equipment and wiring are protected.

Items to Consider When Planning Protection

The best time to design a lightning protection system is during a structure’s design phase, and the best time to install the system can be during construction. System components can be built in so as to be protected from mechanical displacement and environmental effects, and aesthetic advantages can be gained by such concealment. It is generally less expensive to meet lightning protection requirements during construction. And always install a system that complies with current nationally recognized codes.



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It has been shown, in cases where damage has occurred to a protected structure, that the damage was due to additions or repairs to the building or to deterioration or mechanical damage that was allowed to go undetected and unrepaired, or both. It is recommended that a visual inspection be made annually and that the protection system be thoroughly inspected every five years.

General guidelines for Commercial - Industrial buildings

- Air terminals spaced 20-feet apart around the perimeter of the building.
- Interconnected down conductors.
- Grounding rods at least 10-feet deep.
- Air handling units bonded to system (may need air terminals mounted on unit/s).
- Air terminals mounted within two feet of outside roof corners.
- Mid-roof conductor and air terminals at maximum 50-foot spacing.
- Grounded metal bodies bonded into system.
- Surge arresters installed at main electrical panels.
- Transient voltage surge suppressors installed in receptacles.

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