

Lightning Facts

I. What is Lightning?

- Lightning is a visible electrical discharge that occurs within a cloud, between two clouds, or between a cloud and the surface of the earth.
- As lightning passes through the air it heats the air quickly. This causes the air to expand rapidly and creates the sound wave we hear as thunder. Normally, you can hear thunder about 10 miles from a lightning strike.

Source: National Oceanic and Atmospheric Association (NOAA) www.noaa.gov

Where, When and How Often Does Lightning Strike?

- Average number of thunderstorms on Earth at any given moment: 1,800
- Number of times lightning hits the Earth per second: 100

Source: Weather.com

II. Lightning Injuries and Fatalities

Lightning can occur during any time of the year, but lightning casualties are highest during summer. July is generally the month with the most lightning. Lightning strikes often occur in the afternoon. Two-thirds of all lightning casualties occur between 12-6pm.

- Males are five times more likely than females to be struck by lightning; around 85% of lightning fatalities are men.
- People aged 15–34 years account for almost half of all lightning strike victims (41%). The majority (89%) of lightning deaths occur among whites.
- About one-third (32%) of lightning injuries occur indoors.

Source: CDC

III. Fires Caused by Lightning

From 2007 to 2011 local U.S. fire departments responded to an average of 22,600 fires per year that were started by lightning. These fires caused an average of nine civilian deaths and \$451 million in direct property damage per year. Home fires accounted for 19% of the lightning fires, fires in non-residential structures, including businesses and other non-residential properties, accounted for 7%, vehicle fires accounted for 1%. The remaining 73% were in outdoor and unclassified properties.

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Lightning fires in non-residential properties caused an average of \$108 million in direct damage each year from 2007-2011. The average annual damage in non-residential properties includes:

- \$28 million in storage/facilities
- \$22 million in places of assembly, such as houses of worship and restaurants
- \$19 million in non-home residential properties such as hotels and motels
- \$15 million in mercantile and business properties such as offices, specialty shops and department stores
- \$15 million in industrial and manufacturing facilities
- \$3 million in miscellaneous properties

Source: National Fire Protection Association NFPA

Top 10 States with Estimated Number and Cost of Lightning Claims, Recent Report

State	Number of Claims	Insured Losses (\$ millions)	Average Cost per Claim
GA	11,184	\$56.0	\$5,007
TX	6,419	54.2	8,436
NC	5,711	34.1	5,965
LA	5,547	21.6	3,902
AL	5,199	34.8	6,702
PA	4,483	22.4	4,987
TN	4,317	23.2	5,381
SC	4,011	23.1	5,755
OH	3,942	17.1	4,344
IL	3,849	25.6	6,646
Top 10	54,662	312.1	5,709
Other	60,078	361.4	6,015
U.S.	114,740	673.5	5,869

Source: Insurance Information Institute, State Farm®.



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IV. Lightning-Related Homeowners Losses

Homeowners Insurance Claims and Payout for Lightning Losses, Recent Report

Year	Number of Claims	Insured Losses (\$ millions)	Average Cost per Claim
2009	185,789	\$798.1	\$4,296
2010	213,278	1,033.5	4,846
2011	186,307	952.5	5,112
2012	151,000	969.0	6,400
2013	114,740	673.5	5,869
Percent change, 2012-2013	-24.0%	-30.5%	-8.3%
Percent change, 2003-2013	-38.2%	-15.6%	36.6%

Source: Insurance Information Institute, State Farm®.

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V. What is a Lightning Protection System?

The highly conductive copper and aluminum materials used in a lightning protection system provide a low resistance path to safely ground lightning's dangerous electricity. When the lightning protection network is in place, the lightning strike is intercepted and directed to ground without impact to the structure, occupants or contents.

A lightning protection system that meets national safety standards of NFPA 780 and UL96, UL96A includes the following elements:

1. Strike termination network (air terminals or lightning rods)
2. Down-conductor network
3. Grounding electrode network
4. Equipotential bonding network
5. Surge protection devices (for all incoming power, data and communication lines)

Failure to make proper provisions for special grounding techniques, or any of the above five elements can result in inadequate protection.

The 2014 NFPA 780: Standard for the Installation of Lightning Protection Systems is essential for designers, installers, insurance professionals, AHJs, and anyone responsible for protecting lives and property from fire and related dangers associated with lightning events.

NFPA 780 continues to serve as the LPI-175 reference document used by LPI-certified designers, installers and inspectors.

Source: Lightning Protection Institute

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How Effective are Lightning Protection Systems?

Lightning Protection Systems are highly effective at preventing lightning damage to buildings. A number of authorities have studied the benefits and reported on them, including:

- In January 2003 the American Meteorologist Society issued a Bulletin endorsing the lightning protection requirements, stating, "It is now well established that properly installed and maintained lightning rod-based protection systems significantly decrease lightning damage."
- In 2001 a joint paper was issued by lightning experts at the U.S. Army, Navy, Air Force, National Severe Storms Laboratory, Defense Explosives Safety Board, Department of Energy, NASA and FAA. This paper underscores the critical role that lightning protection systems play in protecting our national infrastructure.

Source: Lightning-risk.org



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Lightning Causes Severe Homeowner Losses

Home insurance claim “severity” costs average at \$8,665, with the most expensive claims coming from fire and lightning – where costs can be as much as \$34,307 (claims averaged between 2008 – 2012). Ironpointinsurance.com cites these categories for home insurance claims “perils” that caused loss over the years from 2008-2012.

- Fire & Lightning
- Bodily Injury
- Wind & Hail
- Water
- Property Damage
- Theft
- Medical Payments
- Credit Card & Other

Lightning Protection Provides Good Insurance

Costs for lightning protection systems generally come in at less than 1% the value of a structure, depending upon size, location, roof type, construction, grounding conditions and location. Costs for lightning protection systems typically compare with home security and alarm systems – and are sometimes less expensive. When considering repair and replacement, lightning protection systems provide insurance and peace of mind to safeguard structures, occupants, equipment and valuables from costly, yet preventable risk!

Source: The Lightning Safety Alliance