

**LOSS CONTROL DATA GUIDE**

## Lightning Protection Evaluation of Exposure

Over 200 deaths and more than 300 million dollars in property losses result from lightning annually. Lightning contains energy of up to 100 million volts. As a result of this energy, lightning is capable of producing severe damage to computer, telecommunications, and similar installations.

This guideline is provided to assist building owners, managers and those responsible for electronic systems in evaluating their risk of loss from lightning.

Installation of lightning protection equipment or systems should be performed by a qualified contractor in accordance with provisions of the National Electrical Code and Underwriters Laboratories "Master Label."

In order to determine the relative risk of loss from lightning, the following factors are considered:

- |                            |                              |
|----------------------------|------------------------------|
| “A” – Type of Structure    | “D” – Topography             |
| “B” – Type of Construction | “E” – Occupancy and Contents |
| “C” – Relative Exposure    | “F” – Lightning Frequency    |

These variables are substituted in the formula:

$$R = \frac{A + B + C + D + E}{F}$$

The “R” value obtained is compared to the degree of risk as follows:

<u>“R” Value</u>	<u>Degree of Lightning Risk</u>
0 – 2	Slight
2 – 3	Low
3 – 4	Moderate
4 – 7	High
Over 7	Severe

**LOSS CONTROL DATA GUIDE continued**



<u>“A” – Type of Structure</u>	
Structure	“A” Value
Single family residence less than 5,000 sq. ft. ....	1
Single family residence over 5,000 sq. ft. ....	2
Residential, office or factory building less than 50 feet in height:	
Covering less than 25,000 sq. ft. of ground area .....	3
Covering over 25,000 sq. ft. of ground area .....	5
Residential, office or factory building from 50 to 75 feet high ..	4
Residential, office or factory building from 75 to 150 feet high	5
Residential, office or factory building 150 feet or higher .....	8
Public Utility buildings .....	7
Municipal services buildings .....	7
Libraries, Museums, Historical structures .....	8
Farm buildings, golf shelters and other recreational shelters ....	9
Places of public assembly such as schools, churches, theatres, stadiums .....	9
Slender structures such as smokestacks, church steeples and spires, control towers, lighthouses, etc. ....	10
Hospitals, nursing homes, housing for the elderly or handicapped .....	10
Buildings housing the manufacture, storage or handling of hazardous materials .....	10

<u>“C” – Relative Exposure</u>	
Exposure	“C” Value
Buildings in urban areas among higher structures:	
Small buildings—covering ground area of less than 10,000 square feet .....	1
Large buildings—covering ground area of more than 10,000 square feet .....	2
Buildings in suburban areas with no high structures:	
Small buildings—covering ground area of less than 10,000 square feet .....	4
Large buildings—covering ground area of more than 10,000 square feet .....	5
Buildings extending up to 50 feet above adjacent structures .....	6
Buildings located in rural area—any size .....	7
Buildings located in open country (no other structures or trees in immediate area) .....	10
Buildings extending more than 50 feet above adjacent structures .....	10

<u>“D” – Topography</u>	
Situation	“D” Value
On flat land .....	1
On hillside .....	2
On hill top .....	4
On mountain top .....	5

<u>“B” – Type of Construction</u>		
Framework	Roof	“B” Value
Nonmetallic (Other than wood)	Wood .....	5
	Composition .....	3
	Metal—not continuous .....	3
	Metal—electrically continuous .....	1
Wood	Wood .....	5
	Composition .....	3
	Metal—not continuous .....	4
	Metal—electrically continuous .....	2
Reinforced concrete	Wood .....	4
	Composition .....	3
	Metal—not continuous .....	4
Structural steel	Metal—electrically continuous .....	2
	Wood .....	3
	Composition .....	2
	Metal—not continuous .....	3
	Metal—electrically continuous .....	1

<u>“E” – Occupancy—Contents</u>	
Contents	“E” Value
Nonflammable materials—seldom occupied .....	1
Ordinary furnishings or equipment—small occupancy .....	2
Cattle and livestock .....	3
Small assembly of people—less than 100 .....	4
Combustible materials .....	5
Large assembly of people—100 or more .....	6
High value materials or equipment .....	7
Essential services—police, fire, etc. ....	8
Immobile or bedfast persons .....	8
Flammable liquids or gases—gasoline, hydrogen, etc. ....	8
Historic contents .....	10
Explosives and explosive ingredients .....	10

<u>“F” – Lightning Frequency</u>	
Isoceraunic Level	“F” Value
0–5 .....	9
6–10 .....	8
11–20 .....	7
21–30” .....	6
31–40” .....	5
41–50 .....	4
51–60 .....	3
61–70 .....	2
Over 70 .....	1
Due to storm characteristics, multiply “R” Values for the northeastern U.S. (Isoceraunic Levels of 20–40) by 1.5	
Multiply “R” Values in southeastern U.S. (Isoceraunic Levels of 70–100) by .5	

The loss prevention information and advice presented in this brochure are intended only to advise our insureds and their managers of a variety of methods and strategies based on generally accepted safe practices, for controlling potentially loss producing situations commonly occurring in business premises and/or operations. They are not intended to warrant that all potential hazards or conditions have been evaluated or can be controlled. They are not intended as an offer to write insurance coverage for such conditions or exposures, or to imply that Great American Insurance Company will write such coverage. The liability of Great American Insurance Company is limited to the specific terms, limits and conditions of the insurance policies issued.