



**RESEARCH**

# **Fires in Industrial and Manufacturing Properties**

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March 2018

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## **Abstract**

During 2011-2015, there were an estimated 37,910 fires at industrial or manufacturing properties (including utility, defense, agriculture, and mining) reported to U.S. fire departments each year, with associated annual losses of 16 civilian deaths, 273 civilian injuries, and \$1.2 billion in direct property damage. The vast majority of these fires (71%) occurred in outside or unclassified locations, with another 20% taking place in structures and 9% of the fires in vehicles. The 20% of fires taking place in structures accounted for the largest shares of losses in all categories – 49% of civilian deaths, 80% of civilian injuries, and 67% of direct property damage. Almost two-thirds (65%) of the combined industrial or manufacturing facility structure fires occurred specifically in manufacturing properties (as opposed to utility, industrial, defense, agriculture, and mining properties).

Keywords: fire statistics, industrial fires, manufacturing fires, non-residential fires, research, exposure to hazards, US/National, discarded materials, structure fires, electrical failures, mechanical failures, confined structure fires, vehicle fires

## **Acknowledgements**

The National Fire Protection Association thanks all the fire departments and state fire authorities who participate in the National Fire Incident Reporting System (NFIRS) and the annual NFPA fire experience survey. These firefighters are the original sources of the detailed data that make this analysis possible. Their contributions allow us to estimate the size of the fire problem.

We are also grateful to the U.S. Fire Administration for its work in developing, coordinating, and maintaining NFIRS.

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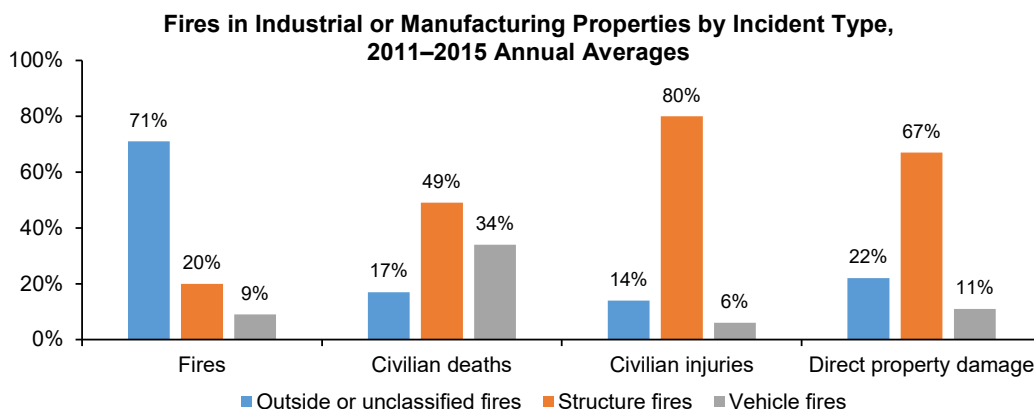


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## Industrial and Manufacturing Property Fires

During 2011–2015, an estimated **37,910** fires in industrial and manufacturing properties were reported to U.S. fire departments per year. These included:

- ▶ **26,730** outside or unclassified fires
- ▶ **7,770** structure fires
- ▶ **3,410** vehicle fires
- ▶ An estimated \$1.2 billion in property damage per year



- ▶ Structure fires are more common in manufacturing or processing properties, while vehicle fires are more common in agricultural properties.
- ▶ Electrical distribution and lighting equipment was involved in 24% of structure fires, and heating equipment was involved in another 16% of these fires.
- ▶ Hot ember or ash was the leading heat source in 15% of outside non-trash fires in industrial properties.
- ▶ Vehicle fires are more common in the fall months, particularly in October, likely due to harvesting activities.

### Codes & Standards Related to Industrial and Manufacturing Properties

NFPA 30, *Flammable and Combustible Liquids Code* – [www.nfpa.org/30](http://www.nfpa.org/30)

NFPA 61, *Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities* – [www.nfpa.org/61](http://www.nfpa.org/61)

NFPA 101®, *Life Safety Code*® – [www.nfpa.org/101](http://www.nfpa.org/101)

NFPA 654, *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids* – [www.nfpa.org/654](http://www.nfpa.org/654)

NFPA 664, *Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities* – [www.nfpa.org/664](http://www.nfpa.org/664)

NFPA 5000®, *Building Construction and Safety Code*® – [www.nfpa.org/5000](http://www.nfpa.org/5000)

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## Table of Contents

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	<b>Page</b>
List of Figures	ii
List of Tables	iii
Fires in Industrial and Manufacturing Properties Overview	1
Structure Fires	4
Industrial Properties	5
Vehicle Fires	9
Outside and Unclassified Fires	13
Supporting Tables	20
Appendix A. How National Estimates Statistics Are Calculated	100
Appendix B. Methodology and Definitions Used in “Leading Cause” Tables	107

## List of Figures

---

	<b>Page</b>
<b>Trends in Industrial or Manufacturing Properties Overview</b>	
Figure 1. Fires	1
Figure 2. Civilian Deaths	2
Figure 3. Civilian Injuries	2
Figure 4. Direct Property Damage	3
<b>Structure Fires at Industrial Properties</b>	
Figure 5. By Leading Cause	5
Figure 6. By Extent of Flame Spread	7
<b>Structure Fires at Manufacturing Properties</b>	
Figure 7. By Leading Cause	7
Figure 8. By Extent of Flame Spread	9
<b>Vehicle Fires at Industrial Properties</b>	
Figure 9. By Incident Type	11
Figure 10. By Heat Source	11
<b>Vehicle Fires at Manufacturing Properties</b>	
Figure 11. By Incident Type	12
<b>Outside and Unclassified Fires in Industrial and Manufacturing Properties</b>	
Figure 12. By Property Use	14
<b>Outside and Unclassified Fires in Industrial Properties</b>	
Figure 13. By Month	14
<b>Outside and Unclassified Fires in Manufacturing Properties</b>	
Figure 14. By Month	14
<b>Outside Trash and Rubbish Fires in Industrial Properties</b>	
Figure 15. By Factor Contributing to Ignition	15
<b>Non-Trash Outside and Unclassified Fires in Industrial Properties</b>	
Figure 16. By Leading Factor Contributing to Ignition	16
<b>Outside Trash and Rubbish Fires in Manufacturing Properties</b>	
Figure 17. By Leading Factor Contributing to Ignition	17
<b>Non-Trash Outside and Unclassified Fires in Manufacturing Properties</b>	
Figure 18. By Leading Factor Contributing to Ignition	18

## List of Tables

---

	<b>Page</b>
<a href="#">Table A.</a> Industrial and Manufacturing Properties, 2011-2015 annual averages	1
<a href="#">Table B.</a> Structure Fires in Industrial and Manufacturing Properties, by Property Use	4
<a href="#">Table C.</a> Vehicle Fires at Industrial and Manufacturing Properties, by Property Use	10
<b>Trends in Industrial and Manufacturing Properties</b>	
<a href="#">Table 1A.</a> Fires	20
<a href="#">Table 1B.</a> Civilian Fire Deaths	21
<a href="#">Table 1C.</a> Civilian Injuries	22
<a href="#">Table 1D.</a> Direct Property Damage (as reported)	23
<a href="#">Table 1E.</a> Direct Property Damage (2015 dollars)	24
<a href="#">Table 2.</a> By Month	25
<a href="#">Table 3.</a> By Day of Week	26
<a href="#">Table 4.</a> By Time of Day	27
<b>Structure Fires in Industrial Properties</b>	
<a href="#">Table 5.</a> By Leading Cause	28
<a href="#">Table 6.</a> By Equipment Involved in Ignition	29
<a href="#">Table 7.</a> By Cause of Ignition	31
<a href="#">Table 8.</a> By Factor Contributing to Ignition	32
<a href="#">Table 9.</a> By Heat Source	34
<a href="#">Table 10.</a> By Area of Origin	36
<a href="#">Table 11.</a> By Item First Ignited	39
<a href="#">Table 12.</a> By Extent of Flame Spread	41
<b>Structure Fires in Manufacturing Properties</b>	
<a href="#">Table 13.</a> By Leading Cause	42
<a href="#">Table 14.</a> By Equipment Involved in Ignition	43
<a href="#">Table 15.</a> By Cause of Ignition	45
<a href="#">Table 16.</a> By Factor Contributing to Ignition	46
<a href="#">Table 17.</a> By Heat Source	48
<a href="#">Table 18.</a> By Area of Origin	50
<a href="#">Table 19.</a> By Item First Ignited	52
<a href="#">Table 20.</a> By Extent of Flame Spread	54
<b>Vehicle Fires in Industrial Properties</b>	
<a href="#">Table 21.</a> By Month	55
<a href="#">Table 22.</a> By Day of Week	56
<a href="#">Table 23.</a> By Time of Day	57
<a href="#">Table 24.</a> By Incident Type	58
<a href="#">Table 25.</a> By Factor Contributing to Ignition	59
<a href="#">Table 26.</a> By Heat Source	60
<a href="#">Table 27.</a> By Area of Origin	61
<a href="#">Table 28.</a> By Item First Ignited	62
<a href="#">Table 29.</a> By Cause of Ignition	63

## List of Tables (Continued)

---

	<b>Page</b>
<b>Vehicle Fires in Manufacturing Properties</b>	
Table 30. By Month	65
Table 31. By Day of Week	66
Table 32. By Time of Day	67
Table 33. By Incident Type	68
Table 34. By Factor Contributing to Ignition	69
Table 35. By Heat Source	70
Table 36. By Area of Origin	71
Table 37. By Item First Ignited	72
Table 38. By Cause of Ignition	73
<b>Outside and Unclassified Fires in Industrial and Manufacturing Properties</b>	
Table 39. Outside Trash or Rubbish Fires in Industrial and Manufacturing Properties, by Property Use	74
Table 40. Non-Trash Outside and Unclassified Fires in Industrial and Manufacturing Properties, by Property Use	75
Table 41. Outside Trash or Rubbish Fires in Industrial Properties, by Month	76
Table 42. Non-Trash Outside and Unclassified Fires in Industrial Properties, by Month	77
Table 43. Outside Trash and Rubbish Fires in Manufacturing Properties, by Month	78
Table 44. Non-Trash Outside and Unclassified Fires in Manufacturing Properties, by Month	79
Table 45. Outside Trash and Rubbish Fires in Industrial Properties, by Day of Week	80
Table 45A. Non-Trash Outside and Unclassified Fires in Industrial Properties, by Day of Week	80
Table 46. Outside Trash and Rubbish Fires in Manufacturing Properties, by Day of Week	81
Table 46A. Non-Trash Outside and Unclassified Fires in Manufacturing Properties, by Day of Week	81
Table 47. Outside Trash and Rubbish Fires in Industrial Properties, by Time of Day	82
Table 47A. Non-Trash Outside and Unclassified Fires in Industrial Properties, by Time of Day	83
Table 48. Outside Trash and Rubbish Fires in Manufacturing Properties, by Day of Week	84
Table 48A. Non-Trash Outside and Unclassified Fires in Manufacturing Properties, by Day of Week	85

## List of Tables (Continued)

---

	<b>Page</b>
<a href="#">Table 49.</a> Outside Trash and Rubbish Fires in Industrial Properties, by Leading Cause	86
<a href="#">Table 49A.</a> Non-Trash Outside and Unclassified Fires in Industrial Properties, by Leading Cause	86
<a href="#">Table 50.</a> Outside Trash and Rubbish Fires in Industrial Properties, By Factor Contributing to Ignition	87
<a href="#">Table 50A.</a> Non-Trash Outside and Unclassified Fires in Industrial Properties, by Factor Contributing to Ignition	88
<a href="#">Table 51.</a> Outside Trash and Rubbish Fires in Industrial Properties, by Heat Source	89
<a href="#">Table 51A.</a> Non-Trash Outside and Unclassified Fires in Industrial Properties, by Heat Source	90
<a href="#">Table 52.</a> Outside Trash and Rubbish Fires in Industrial Properties, by Item First Ignited	91
<a href="#">Table 52A.</a> Non-Trash Outside and Unclassified Fires in Industrial Properties, by Item First Ignited	92
<a href="#">Table 53.</a> Outside Trash and Rubbish Fires in Manufacturing Properties, by Leading Cause	93
<a href="#">Table 53A.</a> Non-Trash Outside and Unclassified Fires in Manufacturing Properties, by Leading Cause	93
<a href="#">Table 54.</a> Outside Trash and Rubbish Fires in Manufacturing Properties, by Factor Contributing to Ignition	94
<a href="#">Table 54A.</a> Non-Trash Outside and Unclassified Fires in Manufacturing Properties, by Factor Contributing to Ignition	95
<a href="#">Table 55.</a> Outside Trash and Rubbish Fires in Manufacturing Properties, by Heat Source	96
<a href="#">Table 55A.</a> Non-Trash Outside and Unclassified Fires in Manufacturing Properties, by Heat Source	97
<a href="#">Table 56.</a> Outside Trash and Rubbish Fires in Manufacturing Properties, by Item First Ignited	98
<a href="#">Table 56A.</a> Non-Trash Outside and Unclassified Fires in Manufacturing Properties, by Item First Ignited	99



## Fires in Industrial and Manufacturing Properties Overview

During 2011-2015, there were an estimated 37,910 fires at industrial and manufacturing properties (including utility, defense, agriculture, and mining) reported to U.S. fire departments each year, with associated annual losses of 16 civilian deaths, 273 civilian injuries, and \$1.2 billion in direct property damage. As indicated in Table A, the vast majority of these fires (71%) occurred in outside or unclassified locations, with another 20% taking place in structures and 9% of the fires in vehicles. The 20% of fires taking place in structures accounted for the largest shares of losses in all categories – 49% of civilian deaths, 80% of civilian injuries, and 67% of direct property damage. Vehicle fires also accounted for a disproportionate share of civilian deaths, (34%), although this association should be viewed cautiously due to low numbers.

**Table A.**  
**Fires in Industrial and Manufacturing Properties, by Incident Type**  
**2011-2015 Annual Averages**

Incident Type	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Outside or unclassified fires	26,730	(71%)	3	(17%)	38	(14%)	\$265	(22%)
Non-trash outside or unclassified fire	23,210	(61%)	3	(17%)	37	(14%)	\$262	(22%)
Outside trash or rubbish fire	3,520	(9%)	0	(0%)	1	(0%)	\$3	(0%)
Structure fire	7,770	(20%)	8	(49%)	219	(80%)	\$799	(67%)
Vehicle fire	3,410	(9%)	6	(34%)	17	(6%)	\$125	(11%)
<b>Total</b>	<b>37,910</b>	<b>(100%)</b>	<b>16</b>	<b>(100%)</b>	<b>273</b>	<b>(100%)</b>	<b>\$1,190</b>	<b>(100%)</b>

As shown in Figure 1 and Table 1A, fires at industrial and manufacturing properties have fallen substantially over the past three decades, from 114,500 fires in 1980 to 39,700 in 2015, a 65% decrease. Note: A new version of the National Fire Incident Reporting System (NFIRS 5.0) was introduced in 1999 and gradually adopted by fire departments. Because data for the transition years 1999 to 2001 are volatile, estimates for those years are not shown.

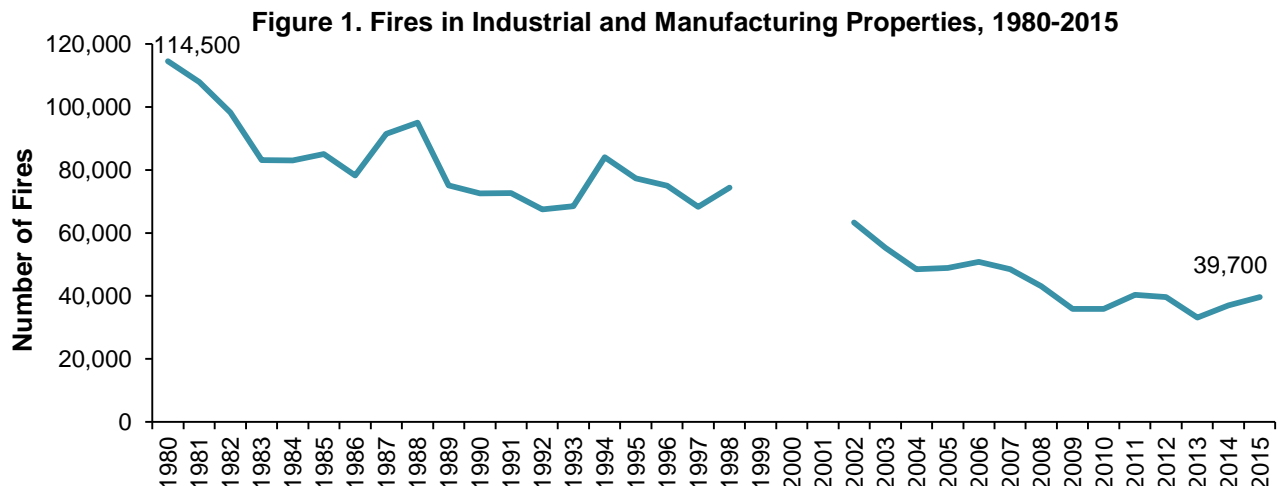
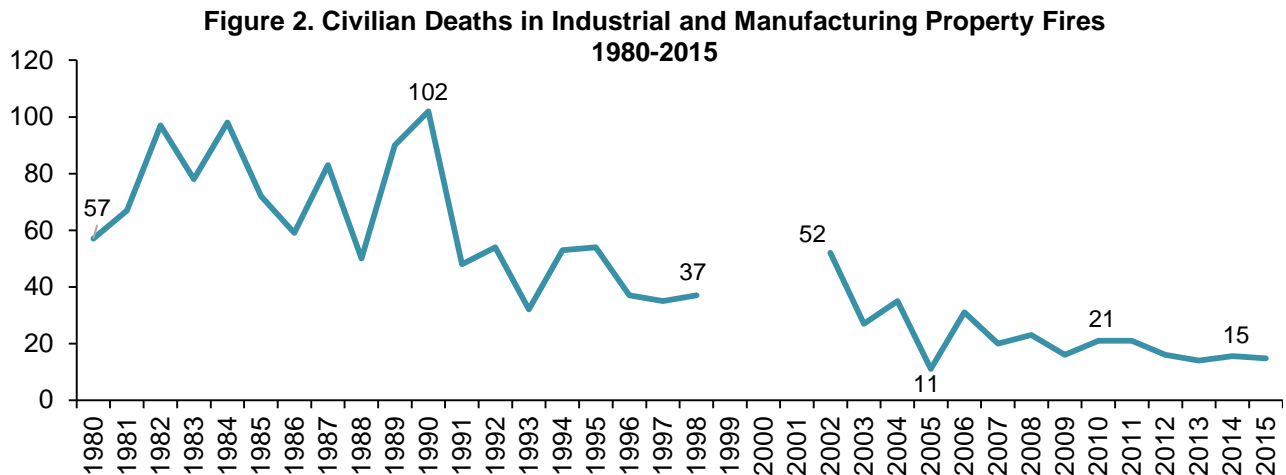
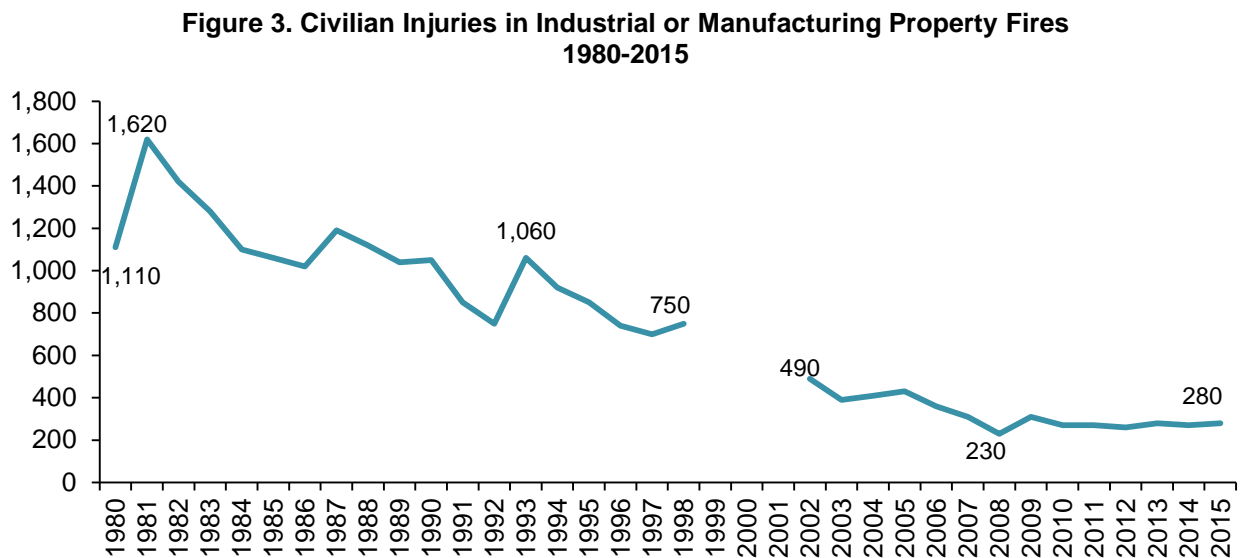


Figure 2 shows that there have been substantial reductions in civilian deaths in industrial and manufacturing properties, although the year-to-year trend is inconsistent. The estimated number of civilian deaths in these fires reached a high of 102 fatalities in 1990 and have been well under that mark in the years since, with fewer than 20 civilian deaths a year since 2012. See also [Table 1B](#).

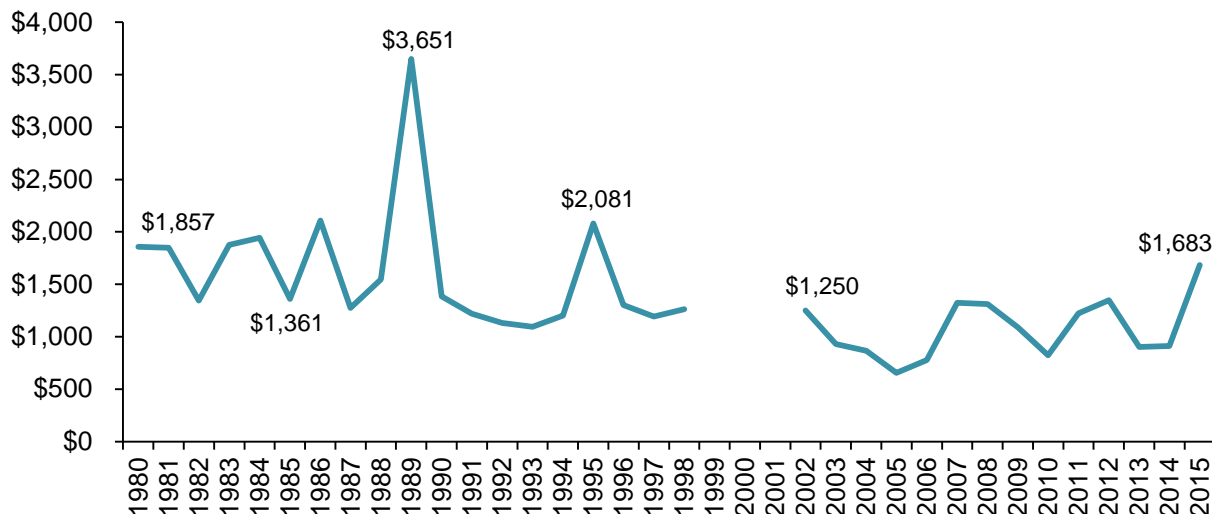


Civilian injuries have also shown a substantial decline, from a peak of 1,620 injuries in 1981 to fewer than 300 each year since 2010, as shown in Figure 3. The trend line for estimated civilian injuries has been fairly flat since 2009. See also [Table 1C](#).



Finally, as shown in Figure 4, annual direct property damages adjusted for inflation are somewhat lower than they were in 1980, but the trend is inconsistent and subject to considerably more year-to-year fluctuation. See [Table 1D](#) for direct property damage as reported and [Table 1E](#) for direct property damage adjusted for inflation.

**Figure 4. Direct Property Damage (in Millions) in Industrial and Manufacturing Property Fires, (in 2015 Dollars), 1980-2015**



### Data Sources, Definitions, and Conventions Used in this Report

Unless otherwise specified, the statistics in this analysis are national estimates of fires reported to U.S. municipal fire departments and so exclude fires reported only to Federal or state agencies or industrial fire brigades. The 2011-2015 estimates are projections based on the detailed information collected in Version 5.0 of the U.S. Fire Administration’s National Fire Incident Reporting System (NFIRS 5.0) and the National Fire Protection Association’s (NFPA’s) annual fire department experience survey. Except for property use and incident type, fires with unknown or unreported data were allocated proportionally in calculations of national estimates. In general, any fire that occurs in or on a structure is considered a structure fire, even if the fire was limited to contents and the building itself was not damaged.

### What are “confined” and “non-confined” fires?

NFIRS 5.0 includes a category of structure fires collectively referred to as “confined fires,” identified by incident type. These include confined cooking fires, confined chimney or flue fires, confined trash fires, confined fuel burner or boiler fires, confined commercial compactor fires, and confined incinerator fires (incident type 113-118). Losses are generally minimal in these fires, which by definition, are assumed to have been limited to the object of origin. Although causal data is not required for these fires, it is sometimes present.

Confined and non-confined fires were analyzed separately and then summed for Cause of Ignition, Heat Source, Factor Contributing to Ignition, Area of Origin, and Item First Ignited. For Equipment Involved in Ignition, the confined fire incident types are assumed to provide causal information without further analysis.

### Additional information

Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Except for trend tables, property damage has not been adjusted for inflation. Fires are rounded to the nearest 100 in trend tables. Otherwise, fires are rounded to the nearest ten, civilian deaths and injuries are rounded to the nearest one, and direct property damage is rounded to the nearest million dollars.

Details on the methodology may be found in [Appendix A](#) and [Appendix B](#).

## Structure Fires

Between 2011 and 2015, municipal fire departments in the U.S. responded to an estimated average of 7,770 structure fires at industrial or manufacturing properties each year, with associated losses of 8 civilian deaths, 219 civilian injures, and \$799 million in direct property damage. Nearly two-thirds of the fires (65%) were in manufacturing or processing properties, and these fires accounted for 78% of civilian deaths, 80% of civilian injuries, and 68% of direct property damage. Fires in agricultural facilities accounted for 11% of fires. Unless otherwise specified, industrial properties in this report refers to properties with NFIRS codes 600 to 699 (Industrial, Utility, Defense, Agriculture, Mining). See Table B.

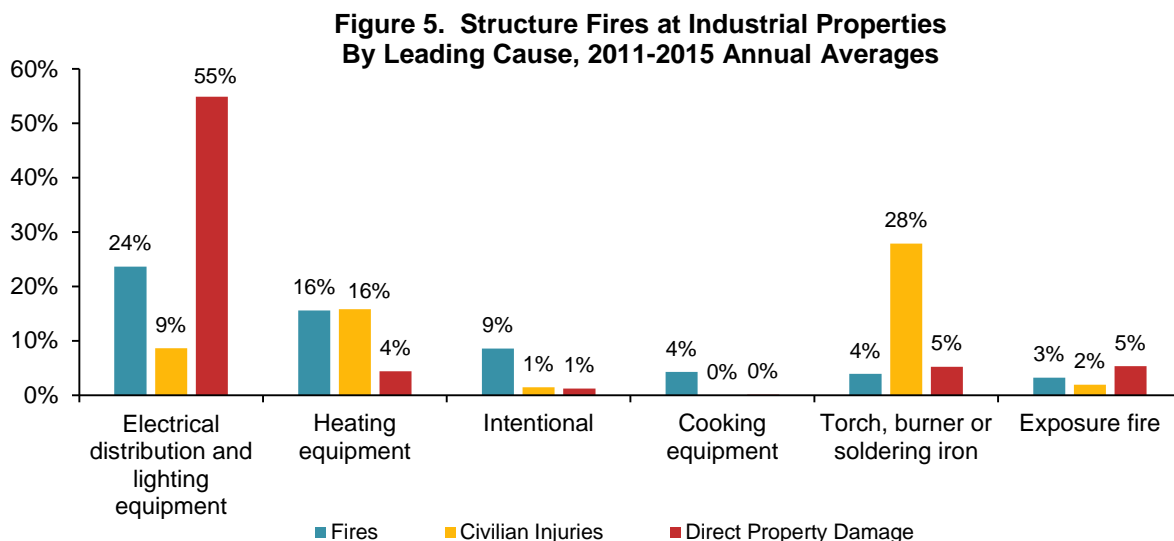
**Table B.**  
**Structure Fires in Industrial and Manufacturing Properties, By Property Use**  
**2011-2015 Annual Averages**

Property Use	Fires	Civilian Deaths	Civilian Injuries	Direct Property Damage (in Millions)
<b>Utility, Defense, Agriculture, Mining</b>	<b>2,690 (35%)</b>	<b>2 (22%)</b>	<b>43 (20%)</b>	<b>\$259 (32%)</b>
Agriculture	880 (11%)	0 (0%)	7 (3%)	\$50 (6%)
Unclassified Utility, Defense, Agriculture, Mining	630 (8%)	0 (3%)	11 (5%)	\$36 (5%)
Utility or distribution system	490 (6%)	1 (11%)	10 (4%)	\$47 (6%)
Energy production plant	200 (3%)	0 (0%)	4 (2%)	\$60 (8%)
Forest, timberland, or woodland	200 (3%)	0 (4%)	1 (1%)	\$2 (0%)
Laboratory	140 (2%)	0 (0%)	9 (4%)	\$11 (1%)
Defense, computer or communications center	90 (1%)	7 (4%)	1 (1%)	\$51 (6%)
Mine or quarry	50 (1%)	0 (4%)	1 (1%)	\$2 (0%)
<b>Manufacturing or processing</b>	<b>5,080 (65%)</b>	<b>6 (78%)</b>	<b>176 (80%)</b>	<b>\$540 (68%)</b>
<b>Total</b>	<b>7,770 (100%)</b>	<b>8 (100%)</b>	<b>219 (100%)</b>	<b>\$799 (100%)</b>

**Timing of Fires.** Table 2 shows that there was generally little variation from month to month in the distribution of structure fires at industrial or manufacturing properties over the course of the year. With the exception of September and December, each with 7% of the annual total, all months recorded 8% to 9% of the annual fire total. The highest shares of injuries occurred in January, May, and December, each of which accounted for 10% of the injury total. August (12%), March (12%) and July (11%) had the highest shares of direct property damage. As would be expected, fewer fires were recorded on weekends, with Saturdays recording 12% of the total and Sundays accounting for 10%, with each of the weekdays recording 15% to 16% of fires. See Table 3. Two out of five fires (40%) occurred in the 12-hour period from 8:00 p.m. to 8:00 a.m. These fires caused 50% of direct property damage, 27% of civilian injuries, and 45% of civilian deaths. See Table 4.

## Industrial Properties

**Electrical distribution and lighting equipment (24%), heating equipment (16%), and intentional fires (9%) were the leading causes of structure fires in industrial properties from 2011 to 2015.** The fires caused by electrical distribution and lighting equipment accounted for over half (55%) of direct property damage, as well as 9% of civilian injuries of these structure fires. Fires caused by heating equipment accounted for 16% of civilian injuries. Nine percent of the fires had an intentional cause, but these fires were associated with 1% of civilian injuries and 1% of direct property damage. Figure 5 shows that other leading causes included cooking equipment (4%), torch, burner or soldering iron (4%), and exposure fires (3%). Fires caused by a torch, burner, or soldering iron were associated with 28% of civilian injuries. See Table 5 for more detailed information on leading causes.



**In addition to electrical distribution and lighting equipment and heating equipment, Table 6 shows that other leading types of equipment involved in the ignition of industrial properties included cooking equipment (4% of total), a torch, burner, or soldering iron (4%), and fans (2%).** The 4% of fires involving a torch, burner or soldering iron accounted for 28% of civilian injuries. [Table 6](#) also shows that among specific types of electrical distribution and lighting equipment, transformers and power supplies accounted for 7% of fires, but 46% of direct property damage.

**Approximately three of five structure fires (59%) in industrial properties had an unintentional cause.** These fires accounted for all civilian deaths, 85% of civilian injuries, and 46% of direct property damage. The remaining fires were due to a failure of equipment or heat source (25%), were intentionally set (9%), were acts of nature (5%), or had an unclassified cause (3%). See [Table 7](#).

**An electrical failure or malfunction was a factor contributing to the ignition of one in five structure fires (20%) in industrial properties, accounting for 9% of civilian injuries and 17% of direct property damage.** [Table 8](#) shows that a mechanical failure or malfunction contributed to the ignition of 17% of these fires (8% of civilian injuries and 25% of direct property damage), while a heat source located too close to combustibles was a factor in 10% of fires, but one quarter (25%) of civilian injuries, and 4% of direct property damage. Other leading factors in these fires included outside or open fires for debris or waste disposal (6%), abandoned or discarded material or product (5%), and cutting or welding too close to combustibles (5%).

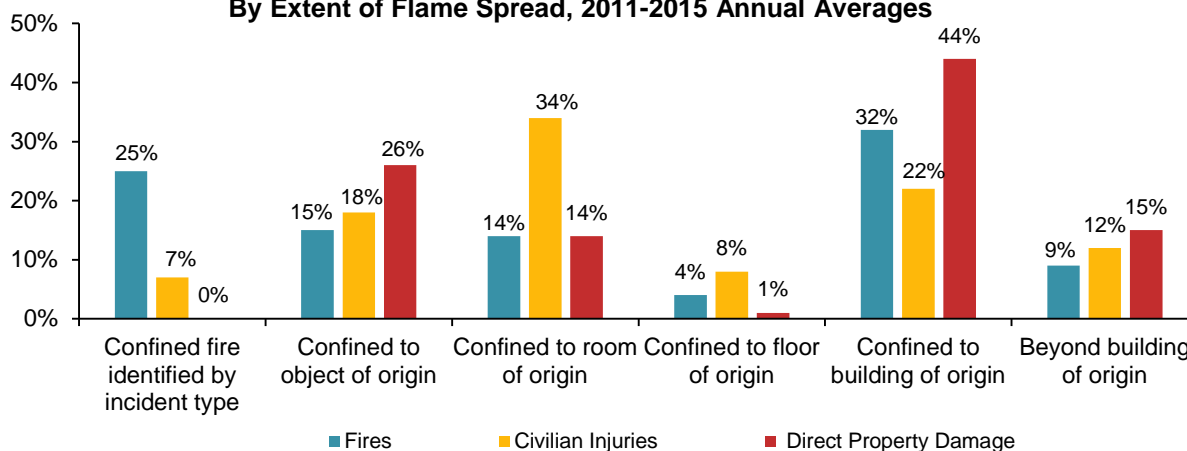
**Unclassified heat from powered equipment (14%), arcing (13%), radiated or conducted heat from operating equipment (12%), and spark, ember, or flame from operating equipment (9%) were the leading heat sources of fires at industrial property structure fires.** See [Table 9](#). Arcing fires caused 30% of direct property damage and those associated with a spark, ember, or flame from operating equipment caused 26% of civilian injuries.

**The leading areas of fire origin in these fires were unclassified outside area, unclassified storage area, and unclassified equipment or service area, each with 7% of the total.** See [Table 10](#). The fires originating in unclassified storage areas accounted for 25% of direct property damage and those originating in unclassified equipment or service area accounted for 10% of civilian injuries. [Table 10](#) shows that fires originating in a processing or manufacturing area or workroom accounted for 4% of fires, but 18% of civilian injuries.

**Leading items first ignited were an agricultural crop (including fruits and vegetables), a flammable or combustible liquid or gas, piping or filter, and electrical wire insulation, each accounting for 9% of fires.** Fires ignited by flammable or combustible liquid or gas, piping or filter were associated with 42% of civilian injuries, and 22% of direct property damage, while those ignited by electrical wire or cable insulation accounted for 11% of direct property damage. The other leading items first ignited included rubbish, trash, or waste (8%), an unclassified item (8% of fires), and a structural member or framing (7%). See [Table 11](#).

**Two in five fires were confined to the object of origin, either by virtue of being coded as confined fires (25%) or as confined to object of origin (15%).** See Figure 6 and Table 12. Fourteen percent of fires were confined to the room of origin, while 6% were confined to the floor of origin, 43% to the building of origin, and 12% extended beyond the building of origin. The 9% of fires that extended beyond the building of origin accounted for 15% of the direct property damage.

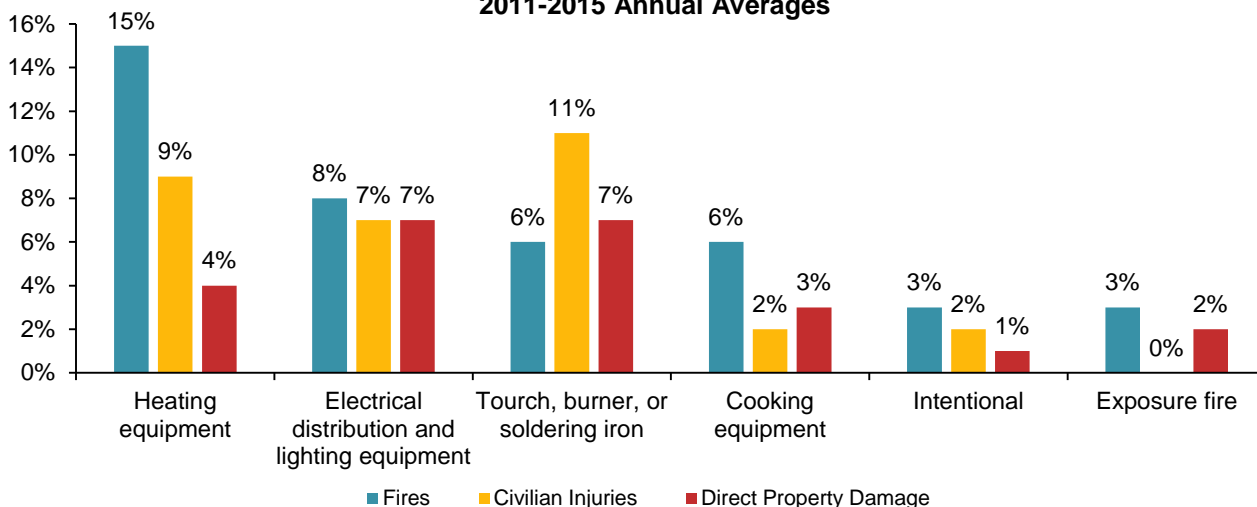
**Figure 6. Structure Fires at Industrial Properties  
By Extent of Flame Spread, 2011-2015 Annual Averages**



### A. Manufacturing Properties

**Heating equipment (15%), electrical distribution and lighting equipment (8%), torch, burner, or soldering iron (6%), and cooking equipment (6%) were the leading causes of structure fires in manufacturing properties from 2011 to 2015.** Figure 7 shows that other leading causes included intentional fires and exposure fires. Of the leading causes, fires started by a torch, burner, or soldering iron accounted for the highest share of civilian injuries (11%), as well as 7% of direct property damage. The fires caused by heating equipment accounted for 9% of civilian injuries in these structure fires, as well as 4% of direct property damage. Fires caused by electrical distribution and lighting equipment accounted for 7% of civilian injuries and 7% of direct property damage. Also see Table 13.

**Figure 7. Structure Fires at Manufacturing Properties By Leading Cause  
2011-2015 Annual Averages**



**In addition to heating equipment, electrical distribution and lighting equipment, and cooking equipment, other leading types of equipment involved in the ignition of manufacturing property fires included a torch, burner, or soldering iron (6%), and heat treating equipment (4%).** A smaller share of fires were ignited by an industrial furnace or kiln (3%), casting, molding, or forging equipment (3%), a fan (3%), a power sander, grinder, buffer, or polisher (2%), air compressors (2%), and extractor or waste recovery machines (2%). The 3% fires involving casting, molding, or forging equipment accounted for 19% of direct property damage. See [Table 14](#).

**Approximately three of five structure fires (59%) in manufacturing property fires had an unintentional cause.** These fires accounted for 75% civilian deaths, 74% of civilian injuries, and 67% of direct property damage. The remaining fires were due to a failure of equipment or heat source (29%), were intentionally set (3%), had an unclassified cause (2%), or were acts of nature (1%). See [Table 15](#).

**A mechanical failure or malfunction was a factor contributing to the ignition of almost three in ten structure fires (28%) in manufacturing properties, accounting for 68% of civilian deaths, 31% of civilian injuries and 22% of direct property damage.** [Table 16](#) shows that an electrical failure or malfunction was a factor contributing to the ignition of 13% of these fires, as well as 9% of civilian injuries and 12% of direct property damage, while failure to clean was a factor in 11% of fires, 10% of civilian deaths, 9% of civilian injuries, and 5% of direct property damage. Cutting or welding too close to combustibles (7%) and heat source too close to combustibles (7%) were other leading contributing factors.

**Unclassified heat from powered equipment (18%), radiated or conducted heat from operating equipment (16%), and spark, ember, or flame from operating equipment (15%) were the leading heat sources of fires at manufacturing property structure fires.** See [Table 17](#). Fires in which the heat source was unclassified heat from powered equipment were associated with 17% of civilian injuries and 24% of direct property damage, while those associated with a spark, ember, or flame from operating equipment caused 15% of civilian injuries. Other leading causes included unclassified heat from hot or smoldering equipment (8% of fires) and arcing (8%).

**The leading area of fire origin in these fires was processing or manufacturing area or workroom, with 23% of the total.** These fires were associated with 40% of civilian deaths, 40% of civilian injuries, and 28% of direct property damage. Unclassified equipment or service areas were the areas of origin in 8% of the total. The fires originating in unclassified equipment or service area accounted for 7% of civilian injuries. See [Table 18](#) for additional details on area of origin.

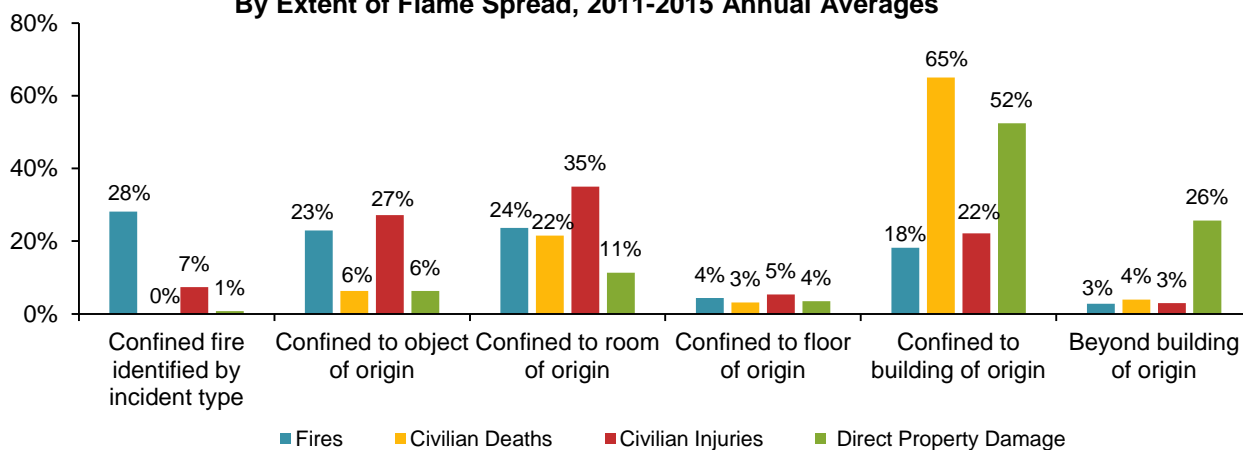
**Leading items first ignited were dust, fiber, lint (including sawdust or excelsior), with 16% of the total fires and flammable or combustible liquid or gas, piping or filter, with 15%.** Fires ignited by flammable or combustible liquid or gas, piping or filter were associated with 48% of civilian deaths, 36% of civilian injuries, and 24% of direct property damage. Other leading items first ignited included unclassified items (8% of fires), rubbish, trash, or waste (6%) and electrical wire or cable insulation (6%). See [Table 19](#) for item first ignited details.

**Just over half of structure fires in manufacturing properties were confined to the object of origin, either by virtue of being coded as confined fires (28%) or as confined to object of origin (23%).** See [Figure 8](#) and [Table 20](#). Almost one quarter of fires (24%) were confined to the



room of origin. Four percent of fires were confined to the floor of origin, 18% to the building of origin, and 3% extended beyond the building of origin. The fires confined to the room of origin accounted for 35% of civilian injuries.

**Figure 8. Structure Fires at Manufacturing Properties By Extent of Flame Spread, 2011-2015 Annual Averages**



## Vehicle Fires

**There were an estimated annual average of 3,410 vehicle fires at industrial or manufacturing properties from 2011 to 2015.** Vehicle fires caused annual averages of six civilian fatalities, 17 civilian injuries, and \$125 million in direct property damage. The 9% of industrial or manufacturing property fires that occurred in vehicles accounted for 34% of civilian deaths, as well as 6% of civilian injuries and 11% of direct property damage associated with all fires in industrial or manufacturing properties. See [Table A](#) on page 1.

**Two of five (39%) vehicle fires at industrial or manufacturing properties occurred in properties used by agriculture.** See [Table C](#). These fires accounted for 23% of civilian injuries and 39% of direct property damage. Properties with manufacturing or processing uses accounted for 23% of fires, but 36% of civilian injuries, while those classified as forest, timberland, or woodland represented 11% of fires, but 37% of civilian deaths. It should be noted that the low numbers of civilian deaths require that these results be interpreted cautiously. Other leading property uses where vehicle fires occurred were utility or distribution systems (7% of fires) and mines or quarries (3%).

**Table C. Vehicle Fires at Industrial or Manufacturing Properties, By Property Use  
2011-2015 Annual Averages**

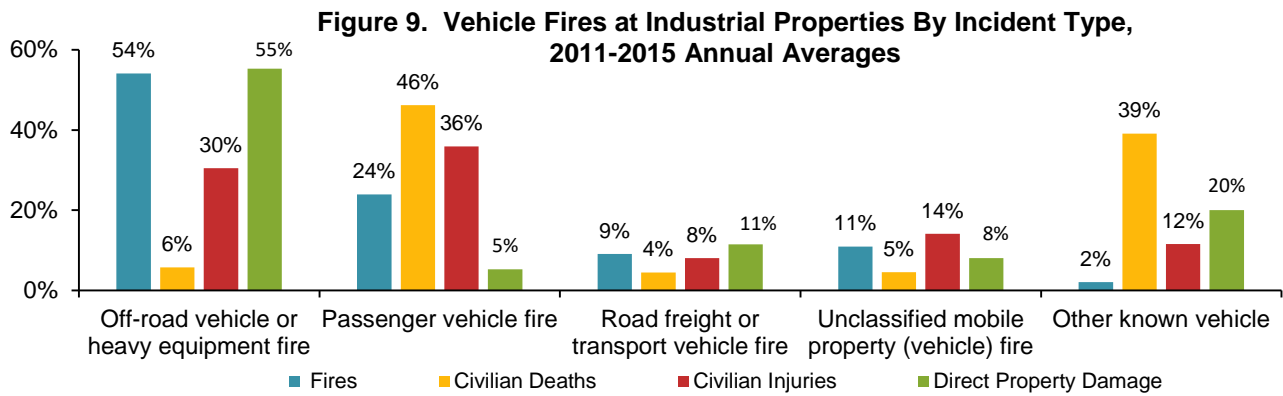
Property Use	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
<b>Industrial, utility, defense, agriculture, mining</b>	<b>2,630</b>	<b>(77%)</b>	<b>5</b>	<b>(84%)</b>	<b>11</b>	<b>(64%)</b>	<b>\$107</b>	<b>(77%)</b>
Unclassified utility, defense, agriculture, mining	530	(16%)	0	(8%)	1	(5%)	\$16	(16%)
Energy production plant	30	(1%)	0	(0%)	1	(5%)	\$1	(1%)
Laboratory	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Defense, computer or communications center	30	(1%)	0	(0%)	0	(0%)	\$19	(1%)
Utility or distribution system	240	(7%)	0	(8%)	2	(10%)	\$9	(7%)
Agriculture	1,320	(39%)	2	(31%)	4	(23%)	\$37	(39%)
Forest, timberland or woodland	380	(11%)	2	(37%)	3	(17%)	\$14	(11%)
Mine or quarry	90	(3%)	0	(0%)	1	(4%)	\$10	(3%)
<b>Manufacturing or processing</b>	<b>780</b>	<b>(23%)</b>	<b>1</b>	<b>(16%)</b>	<b>6</b>	<b>(36%)</b>	<b>\$19</b>	<b>(23%)</b>
<b>Total</b>	<b>3,410</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>17</b>	<b>(100%)</b>	<b>\$125</b>	<b>(100%)</b>

## A. Industrial Properties

### Timing of Fires

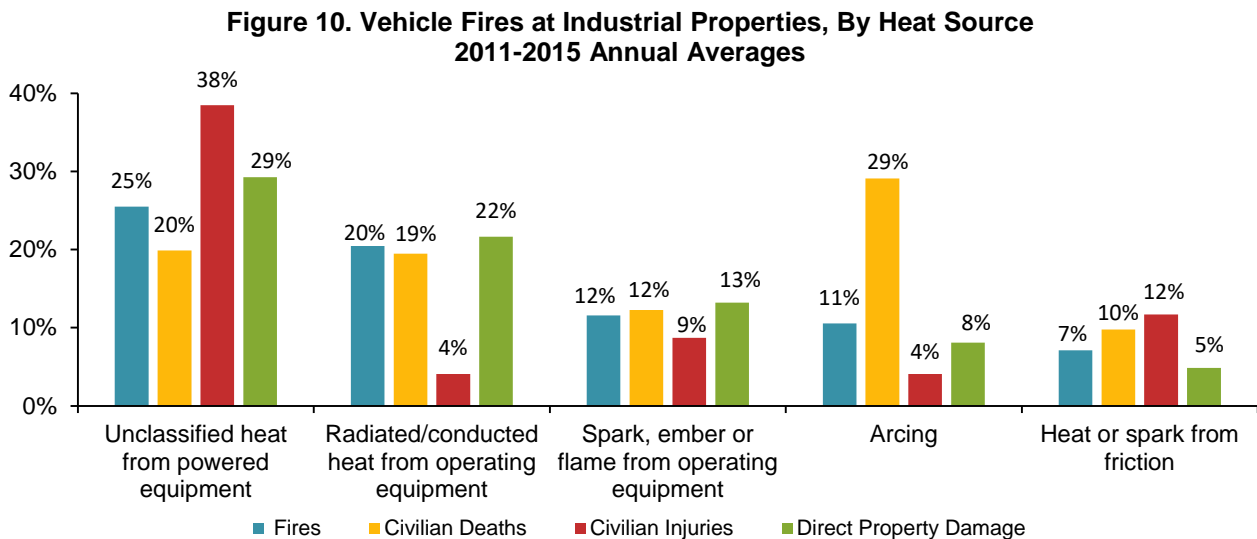
The peak months for vehicle fires in industrial properties were September (10% of total), October (15%), and November (10%). December (6% of fires), January (6%), February (5%), and March (6%) recorded the fewest fires. See [Table 21](#). [Table 22](#) shows that Sundays (11%) had the fewest fires, with the remaining days of the week recording 14% or 16% shares of total fires. Just under one-fifth of the fires (19%) occurred in the 12-hour period between 9 p.m. and 9 a.m., as shown in [Table 23](#).

**Over half of vehicle fires (54%) at industrial properties involved off-road vehicles or heavy equipment, and these fires were associated with 6% of civilian deaths, 30% of civilian injuries and 55% of direct property damage caused by vehicle fires.** See [Figure 9](#) and [Table 24](#). Fires in passenger vehicles accounted for 24% of fires, accounting for 46% of civilian deaths, 36% of civilian injuries, and 5% of direct property damage, while fires in unclassified mobile vehicles accounted for 11% of vehicle fires and road freight or transport vehicles for 9%. Fires in other known vehicles accounted for 2% of vehicle fires, but 39% of civilian deaths, 12% of civilian injuries, and 20% of direct property damage. Nearly all of these losses were in aircraft fires, which represented less than 1% of vehicle fires.



**A mechanical failure or malfunction was the leading factor contributing to ignition of industrial property vehicle fires (46% of total), followed by electrical failure or malfunction (15%).** A mechanical failure or malfunction was associated with 44% of civilian injuries and 53% of direct property damage from these fires. Other leading factors contributing to ignition included unclassified factors (8% of fires), heat source too close to combustibles (6%), failure to clean (5%), and exposure fires (4%). See [Table 25](#).

**The leading heat sources for vehicle fires were unclassified heat from powered equipment (25%) and radiated or conducted heat from operating equipment (20%).** Unclassified heat from powered equipment was associated with 20% of civilian deaths, 38% of civilian injuries, and 29% of direct property damage. Other leading heat sources included a spark, ember, or flame from operating equipment (12% of fires), arcing (11%), and heat or spark from friction (7%). See [Figure 10](#) and [Table 26](#).



**The leading area of origin for vehicle fires at industrial properties was an engine area, running gear, or wheel area of the vehicle (51% of fires), which accounted for 41% of civilian deaths, 35% of civilian injuries, and 55% of direct property damage.** An unclassified vehicle area was the area of origin in 12% of fires, with 28% of civilian deaths, 12% of civilian injuries, and 9% of direct property damage. Other leading areas of origin included the passenger area of the vehicle (7% of fires), a lawn, field, or open area (6%), and an exterior surface of the vehicle (5%). See [Table 27](#).

The items first ignited in vehicle fires at these properties were most often flammable or combustible liquids or gases, piping or filter (21% of fires), agricultural crops (20%), and electrical wire or cable insulation (16%). Fires ignited by flammable or combustible liquids or gases, piping or filter were responsible for 89% of civilian deaths, 52% of injuries and 40% of direct property damage. See [Table 28](#).

Just over half of vehicle fires in industrial properties (52%) had an unintentional cause. Failure of equipment or heat source (35%), intentional fires (9%), and unclassified causes (3%) accounted for the majority of remaining causes. See [Table 29](#).

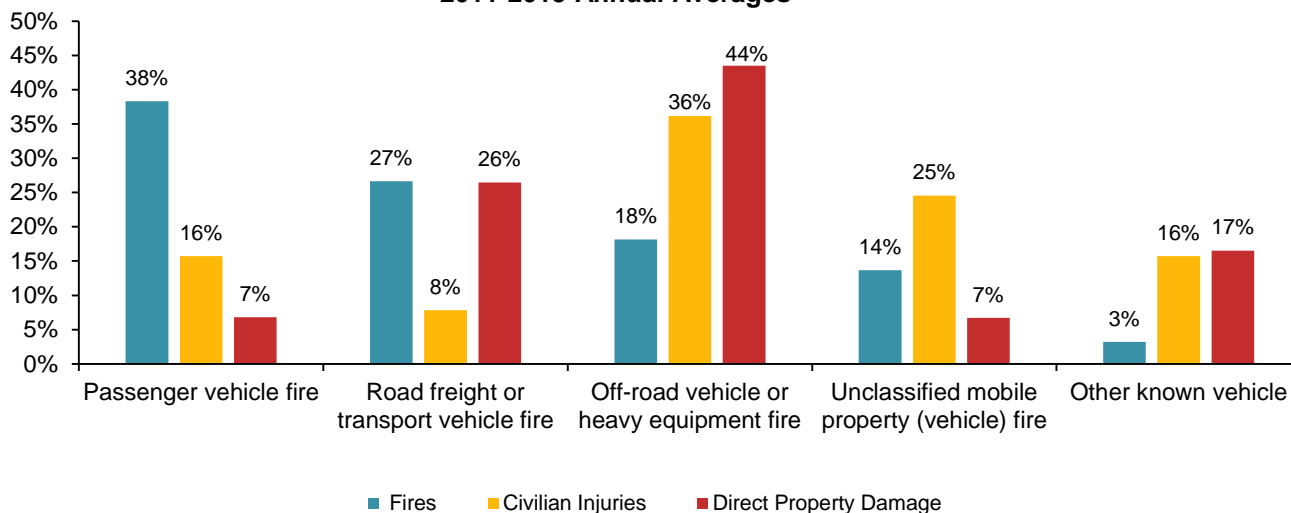
## B. Manufacturing Properties

### Timing of Fires

There was little variation in vehicle fires in manufacturing properties by month. [Table 30](#) indicates that October and December each accounted for 7% of fires, and all other months had 8% or 9% of the annual total. [Table 31](#) shows that Saturdays (10% of total) and Sundays (8%) had the fewest fires, with the remaining days of the week recording 16% or 17% shares of total fires. Almost two in five fires (37%) occurred in the six hour period between 10 a.m. and 4 p.m., as shown in [Table 32](#).

Fires in passenger vehicles accounted for 38% of vehicle fires at manufacturing properties. See [Figure 11](#) and [Table 33](#). Fires in road freight or transportation vehicles accounted for 27% of fires, while fires in off-road vehicles or heavy equipment accounted for 18% of fires, but 36% of civilian injuries and 44% of direct property damage. Another 14% of fires involved unclassified mobile vehicles. Fires in other known vehicles accounted for 3% of vehicle fires, but 16% of civilian injuries and 17% of direct property damage. Most of the direct property damage involving other known vehicles were in aircraft fires, which represented 0.1% of vehicle fires.

**Figure 11. Vehicle Fires at Manufacturing Properties, By Incident Type  
2011-2015 Annual Averages**



A mechanical failure or malfunction was the leading factor contributing to ignition of manufacturing property vehicle fires (37% of total), followed by electrical failure or malfunction (22%). A mechanical failure or malfunction was associated with 32% of civilian

injuries and 32% of direct property damage from these fires, although the injury results should be treated cautiously due to low numbers. Other leading factors contributing to ignition included exposure fires (11%), unclassified factors (6% of fires), heat source too close to combustibles (5%), and cutting or welding too close to combustibles (4%). See [Table 34](#).

**The leading heat sources for vehicle fires at manufacturing properties were unclassified heat from powered equipment (23% of fires), arcing (17%), and radiated or conducted heat from operating equipment (13%).** Other leading heat sources included a spark, ember, or flame from operating equipment (8% of fires), an unclassified hot or smoldering object (7%), and an unclassified heat source (6%). The 8% of fires involving a spark, ember, or flame from operating equipment accounted for 30% of direct property damage. [Table 35](#).

**The leading area of origin for vehicle fires at manufacturing properties was an engine area, running gear, or wheel area of the vehicle (49% of fires), which accounted for 17% of civilian injuries and 42% of direct property damage.** A passenger area (10%), cargo or trunk (9%), unclassified vehicle area (8%), and exterior surface (7%) were other leading areas of origin. See [Table 36](#) for details.

**The items first ignited in vehicle fires at these properties were electrical wire or cable insulation (26%), flammable or combustible liquids or gases, piping or filter (18%), and unclassified items (16%).** Fires ignited by flammable or combustible gases, piping and filter were responsible for almost half (48%) of direct property damage. See [Table 37](#).

**Three in 10 of vehicle fires in manufacturing properties (59%) had an unintentional cause.** Failure of equipment or heat source (30%), unclassified causes (7%) and intentional fires (3%), accounted for the remaining causes. See [Table 38](#).

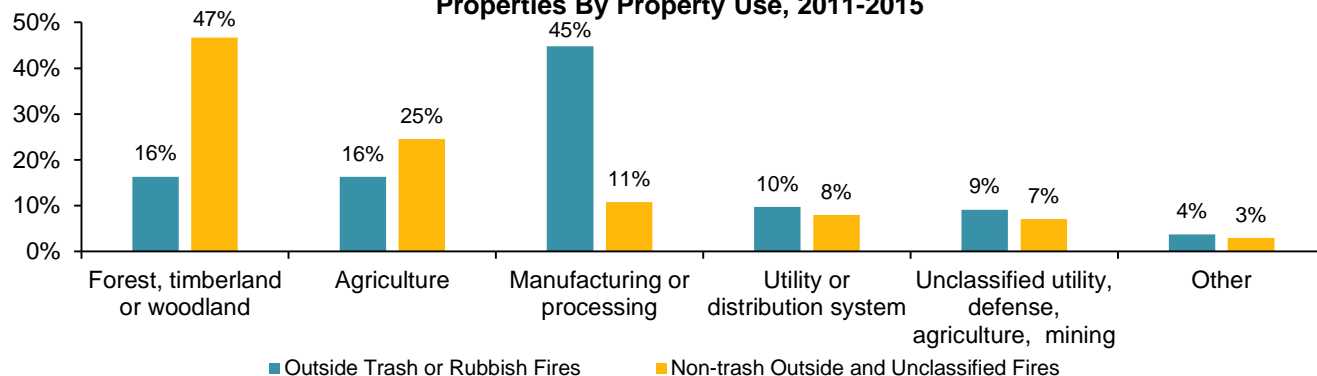
## Outside and Unclassified Fires

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**The largest share of fires at industrial and manufacturing properties took place in outside and unclassified locations.** Outside and unclassified fires are a broad designation comprised of two separate categories – “outside trash or rubbish fires” and “non-trash outside and unclassified fires.” While 71% of fires in industrial or manufacturing properties during the 2011-2015 period were outside and unclassified fires, their share of losses was comparatively small (17% of civilian deaths, 14% of civilian injuries, and 22% of direct property damages). Nearly all of the losses were associated with non-trash outside and unclassified fires. See [Table A](#).

As shown in [Figure 12](#) and [Table 39](#), 45% of outside trash or rubbish fires at industrial and manufacturing properties occur in manufacturing or processing properties (45%), with agricultural locations and forest, timberland, or woodland locations each recording 16% of the total. [Table 40](#) shows that the non-trash outside and unclassified fires at these properties primarily occur in forest, timberland, or woodland (47%) or agricultural (25%) locations.

**Figure 12. Outside and Unclassified Fires in Industrial and Manufacturing Properties By Property Use, 2011-2015**



**Timing of Fires.** Figure 13 and Figure 14 show that outside trash and rubbish fires and non-trash outside and unclassified fires generally followed a similar monthly pattern in both industrial and manufacturing properties, with fewer fires in the cold weather months from November through February and a greater number of fires between March and July. Table 41 shows that three in ten outside trash and rubbish fires in industrial settings occurred in the three month period from March through May. As Figure 13 shows, the peak months were highest in the case of non-trash outside and unclassified fires in industrial settings, with 12% of fires in March and 13% in April, with lows of 3% in December and 6% in January. See Table 42 for more details.

**Figure 13. Outside and Unclassified Fires in Industrial Properties By Month, 2011-2015 Annual Averages**

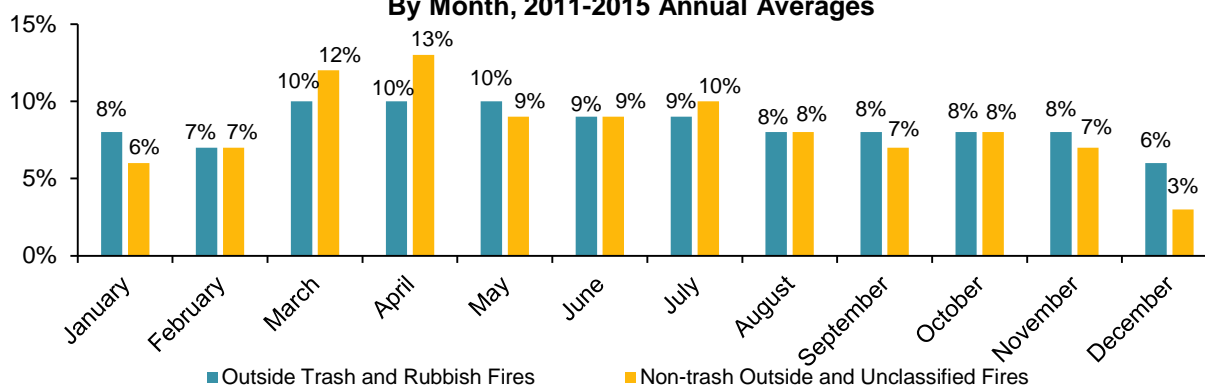
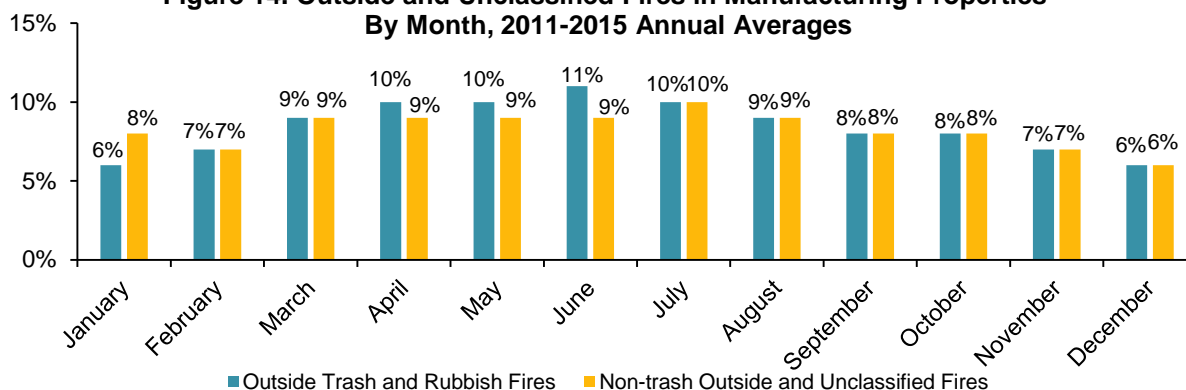


Figure 14 shows the monthly distribution of outside and unclassified fires in manufacturing properties. The high point for outside trash and rubbish fires came in June, with 11% of the total, followed by April, May, and July, each with 10%. Also see Table 43. Non-trash outside and unclassified fires in manufacturing facilities peaked in July (10% of total), with March, April, May, June, and August each having a 9% share of the annual fire total. Additional details are available in Table 44.

**Figure 14. Outside and Unclassified Fires in Manufacturing Properties By Month, 2011-2015 Annual Averages**



Saturday was the peak day for outside trash and rubbish fires (16% of annual total) and non-trash outside and unclassified fires (17%) in industrial properties. These fires ranged from 13% - 15% during the remaining days of the week, with no obvious pattern. Details are available in [Table 45](#) and [Table 45A](#). In manufacturing properties, there were fewer trash and rubbish fires on Saturdays (12% of weekly total) or Sundays (10%) than on weekdays, which ranged from 14% to 17%. Non-trash outside and unclassified fires in manufacturing properties showed similar results – 12% of fires on Saturdays, 10% on Sundays, and 15% to 16% on weekdays. See [Table 46](#) and [Table 46A](#).

There were fewer outside trash and rubbish fires and non-trash outside and unclassified fires in overnight hours and more fires in the afternoon and early evening in both industrial ([Table 47](#) and [Table 47A](#)) and manufacturing properties ([Table 48](#) and [Table 48A](#)). There was less variation in the hourly distribution of fires in manufacturing properties (hourly range from 2% to 7%) than in industrial properties (hourly range from 1% to 11%).

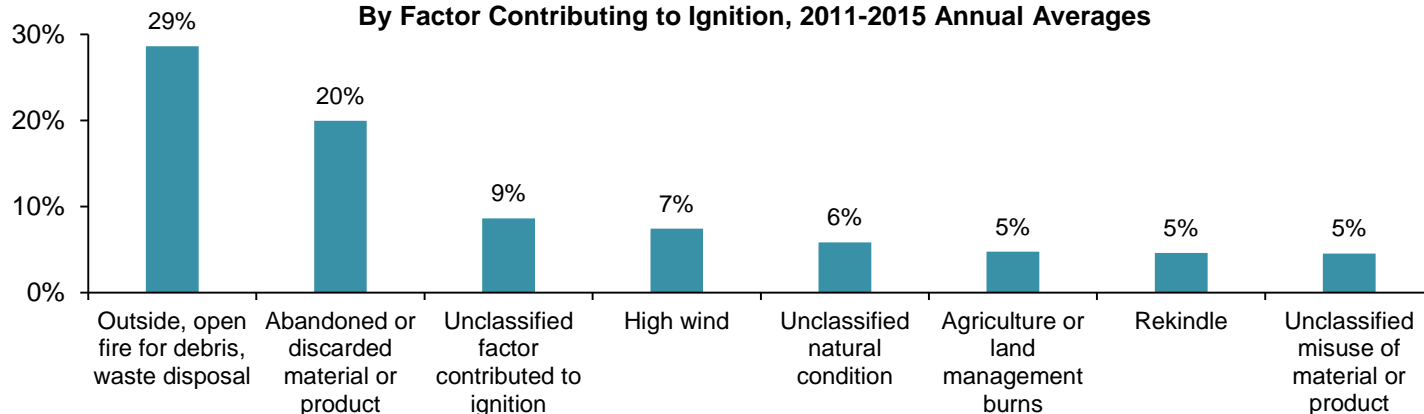
### A. Industrial Properties

**Intentionally set fires were the leading cause of *outside trash and rubbish* fires in industrial properties, accounting for 50% of the total.** Other leading causes included smoking materials (6%), torch, burner, or soldering iron (4%), and electrical distribution and lighting equipment (2%). See [Table 49](#).

***Non-trash outside and unclassified* fires in these properties also most often had an intentional cause (15%).** The other leading causes included lightning (11%), exposure fires (3%), smoking materials (3%), torch, burner, or soldering iron (2%), and playing with a heat source (2%). See [Table 49A](#).

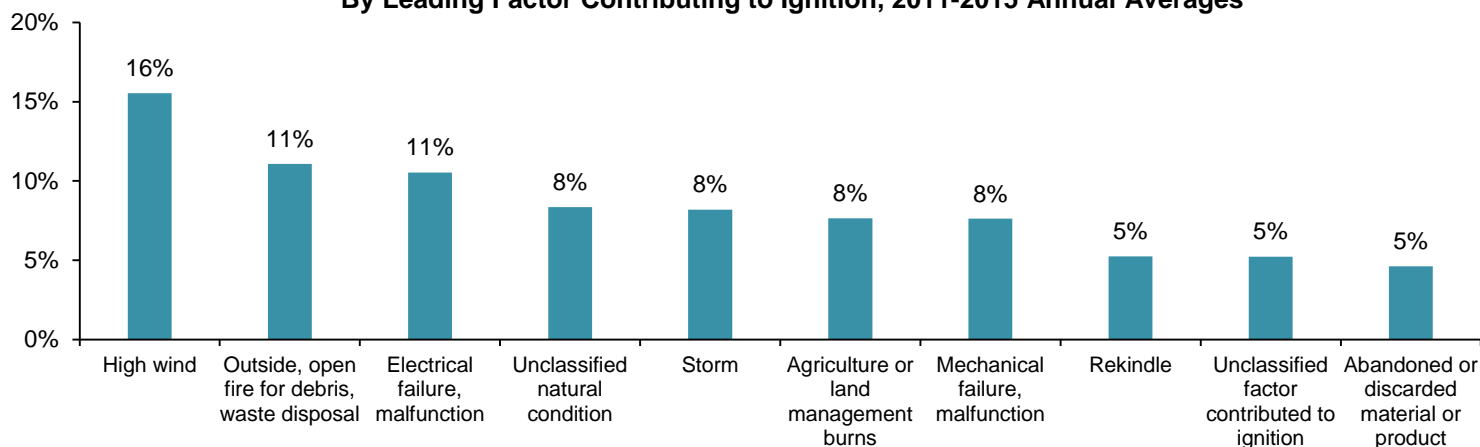
**The leading factor contributing to the ignition of *outside trash and rubbish* fires in industrial properties was outside or open fire for debris or waste disposal, accounting for nearly three in ten fires (29%).** Figure 15 shows that other leading factors contributing to the ignition of these fires included abandoned or discarded materials or products (20%), unclassified factors (9%), high winds (7%), unclassified natural conditions (6%), agriculture or land management burns (5%), rekindling (5%), and unclassified misuse of material or product (5%). Also see [Table 50](#).

**Figure 15. Outside Trash and Rubbish Fires in Industrial Properties  
By Factor Contributing to Ignition, 2011-2015 Annual Averages**



**In non-trash outside and unclassified fires in industrial properties, the leading factor contributing to ignition was high wind, accounting for 16% of fires.** Other leading factors included outside or open fires for debris or waste disposal (11%), electrical failure or malfunction (11%), unclassified natural condition (8%), storms (8%), agriculture or land management burns (8%), mechanical failure or malfunction (8%), rekindling (5%), unclassified factors (5%), and abandoned or discarded material or product (5%). See Figure 16 and [Table 50A](#).

**Figure 16. Non-Trash Outside and Unclassified Fires in Industrial Properties By Leading Factor Contributing to Ignition, 2011-2015 Annual Averages**



**A match served as the heat source in 15% of outside trash and rubbish fires in industrial properties.** As shown in [Table 51](#), other leading heat sources included hot ember or ash (13%), unclassified heat sources (11%), a lighter (11%), an unclassified hot or smoldering object (9%), a flame or torch used for lighting (8%), smoking materials (6%), or spontaneous combustion or chemical reaction (6%).

**In non-trash outside and unclassified fires in these properties, the leading heat source was hot ember or ash (15%).** [Table 51A](#) shows that other leading heat sources included lightning (11%), arcing (10%), unclassified heat sources (8%), a spark, ember, or flame from operating equipment (7%), a flying brand, ember, or spark (6%), and match (6%).

**Rubbish, trash, or waste was the item first ignited in 30% of outside trash and rubbish fires in industrial properties.** Other leading items first ignited were: light vegetation, including grass (14%), unclassified organic materials (9%), heavy vegetation, including trees (7%), unclassified items (7%), agricultural crops, including fruits and vegetables (6%), and multiple items (4%). See [Table 52](#) for details.

**In non-trash outside and unclassified fires in these properties, light vegetation, including grass was the item first ignited in two of five fires (39%) in industrial properties.** The other leading items first ignited were: heavy vegetation, including trees (20% of fires), agricultural crops, including fruits and vegetables (14%), unclassified items (5%), unclassified organic materials (5%), and electrical wire or cable insulation (4%). Additional information is available in [Table 52A](#).

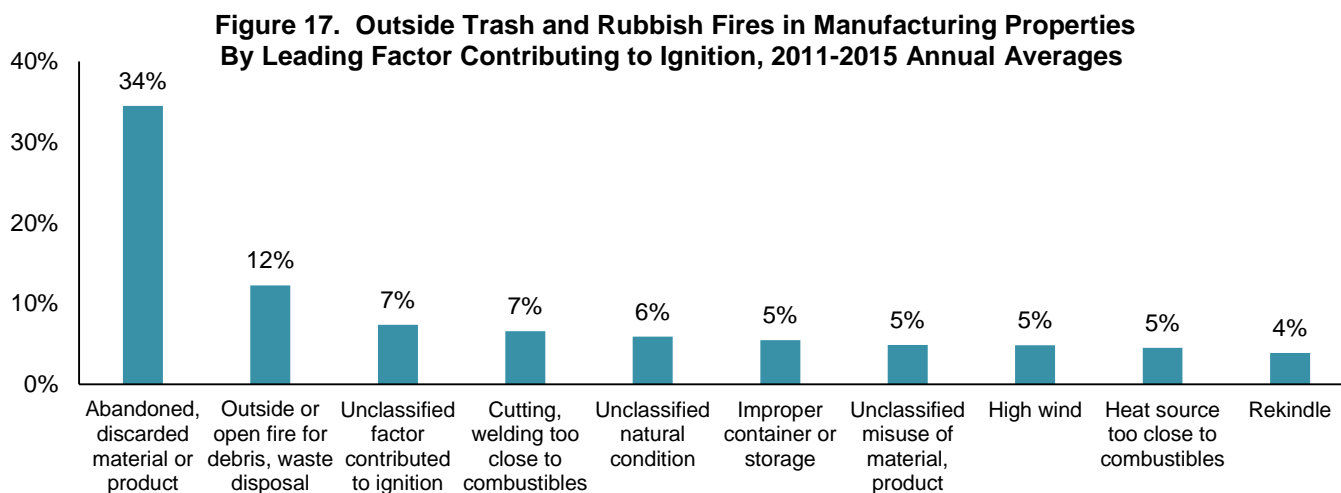


## B. Manufacturing Properties

**Intentionally set fires were the leading cause of *outside trash and rubbish* fires in manufacturing properties, accounting for 16% of the total.** Other leading causes included smoking materials (10%), torch, burner, or soldering iron (6%), and electrical distribution and lighting equipment (2%). See [Table 53](#).

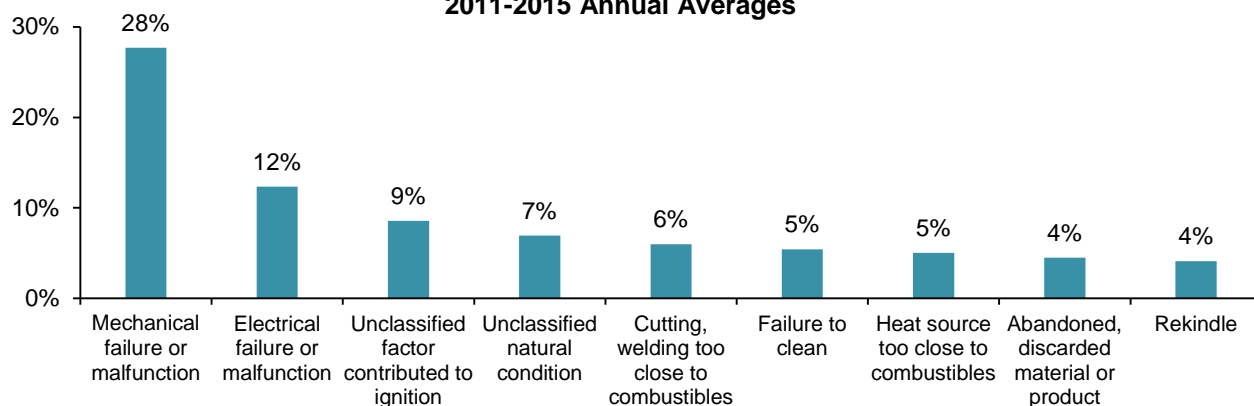
**The leading cause of *non-trash outside and unclassified* fires in these properties was electrical distribution and lighting equipment, accounting for 11% of fires.** As shown in [Table 53A](#), other leading causes of non-trash outside and unclassified fire in manufacturing properties included a torch, burner, or soldering iron (7%), an intentional cause (4%), and smoking materials (2%).

**The leading factor contributing to the ignition of *outside trash and rubbish* fires in manufacturing properties was abandoned or discarded material or product, accounting for 34% of fires.** The other leading factors contributing to the ignition of these fires included outside or open fires for debris or waste disposal (12%), unclassified factors (7%), cutting or welding too close to combustibles (7%), unclassified natural conditions (6%), improper container or storage (5%), unclassified misuse of material or product (5%), high wind (5%), heat source too close to combustibles (5%), and rekindle (4%). See [Figure 17](#) and [Table 54](#).



**The leading factor contributing to the ignition of *non-trash outside and unclassified* fires was mechanical failure or malfunction, with 28% of the manufacturing property fires.** Other factors included electrical failures or malfunctions (12%), unclassified factors (9%), unclassified natural conditions (7%), cutting or welding too close to combustibles (6%), failure to clean (5%), heat source too close to combustibles (5%), abandoned or discarded material or product (4%), and rekindle (4%). See [Figure 18](#) and [Table 54A](#).

**Figure 18. Non-Trash Outside and Unclassified Fires in Manufacturing Properties, By Leading Factors Contributing to Ignition  
2011-2015 Annual Averages**



**Spontaneous combustion or chemical reaction provided the heat source in approximately one-fifth (19%) of *outside trash and rubbish* fires in manufacturing properties.** Other leading heat sources included unclassified hot or smoldering objects (17%), smoking materials (10%), hot ember or ash (10%), lighters (7%), molten or hot material (6%), matches (5%), unclassified heat sources (5%), and spark, ember, or flame from operating equipment (5%). See [Table 55](#).

**The leading heat source in *non-trash outside and unclassified fires* in manufacturing properties was unclassified heat from operating equipment (18% of total).** As shown in [Table 55A](#), a spark, ember, or flame from operating equipment (11%), unclassified hot or smoldering objects (11%), radiated or conducted heat from operating equipment (9%), arcing (8%), unclassified heat sources (7%), hot ember or ash (7%), spontaneous combustion or chemical reaction (6%), heat or spark from friction (6%), and molten or hot material (5%) were other leading heat sources in non-trash outside and unclassified fires in manufacturing properties.

**The item that was most often first ignited in *outside trash and rubbish* fires in manufacturing properties was rubbish trash, or waste, accounting for over two in five fires (44%).** Other leading factors included dust, fiber, or lint, including sawdust or excelsior (8%), unclassified items (7%), multiple items (6%), and unclassified organic materials (4%). See [Table 56](#) for details.

**In *non-trash outside and unclassified fires* in manufacturing properties, flammable or combustible liquids or gases, piping or filter were the leading item first ignited, with 15% of the total.** [Table 56A](#) shows that other leading items included unclassified items (14%), dust, fiber or lint, including sawdust or excelsior (14%), light vegetation, including grass (11%), unclassified organic materials (8%), and electrical wire or cable insulation (5%).

## **NFPA has many resources available covering safety in industrial and manufacturing properties**

**Investigation Reports:** In-depth analysis of major fires in industrial and manufacturing properties.  
[www.nfpa.org/investigations](http://www.nfpa.org/investigations)

**Fire Protection Handbook:** NFPA's Fire Protection Handbook has a full chapter on fire protection in industrial occupancies.

**Codes & Standards:** Many NFPA codes and standards relate to industrial or manufacturing facilities, including:

- NFPA 30: Flammable and Combustible Liquids Code - [www.nfpa.org/30](http://www.nfpa.org/30)
- NFPA 61: Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities - [www.nfpa.org/61](http://www.nfpa.org/61)
- NFPA 101: Life Safety Code® - [www.nfpa.org/101](http://www.nfpa.org/101)
- NFPA 654: Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids - [www.nfpa.org/654](http://www.nfpa.org/654)
- NFPA 664: Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities - [www.nfpa.org/664](http://www.nfpa.org/664)
- NFPA 5000: Building Construction and Safety Code® - [www.nfpa.org/5000](http://www.nfpa.org/5000)

**Table 1A.**  
**Fires in Industrial or Manufacturing Properties,**  
**By Year 1980-2015**

Year	Structure	Vehicle	Non-Trash Outside and Unclassified	Outside Trash or Rubbish	Total
1980	42,100	3,600	68,800		114,500
1981	39,000	3,700	65,200		107,900
1982	35,000	3,600	59,700		98,300
1983	29,900	3,500	49,700		83,100
1984	30,400	3,600	49,000		83,000
1985	30,900	3,600	50,600		85,100
1986	26,400	4,000	47,800		78,300
1987	25,800	5,900	59,700		91,500
1988	24,100	5,500	65,400		95,000
1989	21,700	5,200	48,200		75,100
1990	18,700	4,800	49,100		72,600
1991	18,300	4,700	49,700		72,700
1992	17,500	4,200	45,700		67,500
1993	16,400	4,900	47,200		68,500
1994	18,000	5,600	60,400		84,000
1995	16,300	5,600	55,400		77,300
1996	16,500	5,300	53,200		75,000
1997	17,800	5,100	45,300		68,300
1998	16,100	5,800	52,500		74,400
1999	18,600	6,600	59,800	9,700	94,600
2000	14,800	6,300	58,800	7,300	87,100
2001	13,300	6,000	40,000	6,500	65,800
2002	12,200	5,000	39,900	6,100	63,300
2003	11,500	5,000	33,400	5,300	55,300
2004	11,200	4,900	27,800	4,600	48,500
2005	9,900	4,200	30,000	4,800	48,900
2006	9,500	4,600	31,700	5,000	50,800
2007	10,000	4,600	29,100	4,900	48,500
2008	9,300	4,100	25,100	4,600	43,100
2009	7,100	3,400	21,700	3,700	35,900
2010	7,100	3,600	21,700	3,500	35,900
2011	7,400	3,500	26,000	3,500	40,300
2012	7,300	3,500	24,800	4,000	39,600
2013	7,300	3,300	19,300	3,200	33,100
2014	8,400	3,400	21,800	3,400	37,000
2015	8,600	3,500	24,200	3,400	39,700

Note: These are national estimates of fires reported to U.S. fire departments and so exclude fires reported only to federal or state agencies or industries fire brigades. Fires are rounded to the nearest 100. Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years must be used with caution. Unknowns have been allocated proportionally.

Source: NFIRS and NFPA Fire Experience Survey.

**Table 1B.**  
**Civilian Fire Deaths in Industrial or Manufacturing Properties**  
**By Year 1980-2015**

Year	Structure	Vehicle	Non-Trash Outside and Unclassified	Outside Trash or Rubbish	Total
1980	21	19	17		57
1981	31	26	10		67
1982	50	29	18		97
1983	51	9	18		78
1984	88	2	8		98
1985	37	20	15		72
1986	24	22	13		59
1987	44	18	21		83
1988	30	10	10		50
1989	60	20	10		90
1990	79	11	12		102
1991	21	16	11		48
1992	11	32	11		54
1993	13	13	6		32
1994	16	31	6		53
1995	32	16	6		54
1996	8	18	11		37
1997	16	13	6		35
1998	20	16	1		37
1999	0	0	7	0	7
2000	27	29	0	0	56
2001	33	22	4	0	59
2002	17	32	3	0	52
2003	22	2	2	0	27
2004	6	28	1	0	35
2005	3	3	4	0	11
2006	17	11	2	1	31
2007	9	7	3	0	20
2008	14	4	5	0	23
2009	10	5	1	0	16
2010	6	11	4	0	21
2011	12	4	4	0	21
2012	9	4	3	0	16
2013	4	8	2	0	14
2014	6	7	2	0	16
2015	9	4	2	0	15

Note: National estimates are projections. Casualty projections can be heavily influenced by the inclusion or exclusion of a small number of unusually serious fires. Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years must be used with caution. Deaths have been rounded to the nearest one. Unknowns have been allocated proportionally.

Source: NFIRS and NFPA Fire Experience Survey.

**Table 1C.  
Civilian Injuries in Industrial or Manufacturing Properties,  
By Year 1980-2015**

<b>Year</b>	<b>Structure</b>	<b>Vehicle</b>	<b>Non-Trash Outside and Unclassified</b>	<b>Outside Trash or Rubbish</b>	<b>Total</b>
1980	780	110	230		1,110
1981	1,320	70	230		1,620
1982	1,120	100	210		1,420
1983	1,090	40	150		1,280
1984	850	60	190		1,100
1985	780	70	210		1,060
1986	820	70	120		1,020
1987	990	40	150		1,190
1988	850	60	210		1,120
1989	780	70	190		1,040
1990	830	50	170		1,050
1991	640	50	160		850
1992	550	50	160		750
1993	890	30	140		1,060
1994	650	80	190		920
1995	590	60	210		850
1996	540	40	160		740
1997	490	40	170		700
1998	520	60	170		750
1999	470	0	90	0	570
2000	680	50	100	10	830
2001	330	60	90	10	500
2002	360	50	70	10	490
2003	300	30	60	0	390
2004	310	40	70	10	410
2005	320	20	80	10	430
2006	270	20	60	0	360
2007	240	40	30	0	310
2008	190	10	40	0	230
2009	250	30	20	0	310
2010	220	10	40	0	270
2011	210	20	30	0	270
2012	230	10	20	0	260
2013	230	10	40	0	280
2014	200	10	50	0	270
2015	220	0	40	0	280

Note: National estimates are projections. Casualty projections can be heavily influenced by the inclusion or exclusion of a small number of unusually serious fires. Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years must be used with caution. Injuries have been rounded to the nearest ten. Unknowns have been allocated proportionally.

Source: NFIRS and NFPA Fire Experience Survey.

**Table 1D.**  
**Direct Property Damage (in Millions) in Industrial or Manufacturing Properties**  
**By Year (as Reported) 1980-2015**

Year	Structure	Vehicle	Non-Trash Outside and Unclassified	Outside Trash or Rubbish	Total
1980	\$609	\$17	\$19		\$645
1981	\$659	\$16	\$35		\$710
1982	\$450	\$40	\$58		\$548
1983	\$727	\$29	\$34		\$790
1984	\$804	\$31	\$20		\$854
1985	\$569	\$13	\$37		\$619
1986	\$516	\$17	\$442		\$975
1987	\$542	\$51	\$19		\$612
1988	\$676	\$33	\$63		\$772
1989	\$1,796	\$58	\$54		\$1,909
1990	\$689	\$44	\$30		\$763
1991	\$647	\$35	\$19		\$701
1992	\$539	\$29	\$102		\$670
1993	\$566	\$65	\$37		\$668
1994	\$567	\$54	\$131		\$752
1995	\$1,254	\$47	\$38		\$1,339
1996	\$786	\$38	\$37		\$861
1997	\$709	\$64	\$34		\$807
1998	\$632	\$71	\$166		\$868
1999	\$802	\$106	\$59	\$0	\$967
2000	\$956	\$96	\$156	\$0	\$1,208
2001	\$936	\$73	\$66	\$0	\$1,075
2002	\$853	\$74	\$22	\$0	\$949
2003	\$575	\$86	\$61	\$1	\$722
2004	\$559	\$76	\$54	\$0	\$689
2005	\$447	\$57	\$36	\$1	\$541
2006	\$458	\$87	\$115	\$1	\$661
2007	\$957	\$100	\$100	\$1	\$1,159
2008	\$955	\$76	\$158	\$1	\$1,190
2009	\$815	\$71	\$101	\$1	\$987
2010	\$579	\$88	\$87	\$3	\$757
2011	\$817	\$180	\$163	\$1	\$1,161
2012	\$753	\$104	\$446	\$3	\$1,306
2013	\$557	\$114	\$217	\$1	\$889
2014	\$691	\$110	\$108	\$1	\$910
2015	\$1,175	\$120	\$376	\$12	\$1,683

Note: National estimates are projections. Casualty projections can be heavily influenced by the inclusion or exclusion of a small number of unusually serious fires. Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years must be used with caution. Dollar losses have been rounded to the nearest million. Unknowns have been allocated proportionally.

Source: NFIRS and NFPA Fire Experience Survey.

**Table 1E.**  
**Direct Property Damage (in Millions) in Industrial or Manufacturing Properties**  
**By Year, 1980-2015 (in 2015 dollars)**

Year	Structure	Vehicle	Non-Trash Outside and Unclassified	Outside Trash or Rubbish	Total
1980	\$1,753	\$49	\$55		\$1,857
1981	\$1,715	\$42	\$91		\$1,847
1982	\$1,104	\$98	\$142		\$1,344
1983	\$1,728	\$69	\$81		\$1,878
1984	\$1,831	\$71	\$46		\$1,945
1985	\$1,251	\$29	\$81		\$1,361
1986	\$1,116	\$37	\$956		\$2,109
1987	\$1,130	\$106	\$40		\$1,276
1988	\$1,355	\$66	\$126		\$1,548
1989	\$3,435	\$111	\$103		\$3,651
1990	\$1,251	\$80	\$54		\$1,385
1991	\$1,125	\$61	\$33		\$1,219
1992	\$911	\$49	\$172		\$1,132
1993	\$928	\$107	\$61		\$1,095
1994	\$907	\$86	\$210		\$1,203
1995	\$1,949	\$73	\$59		\$2,081
1996	\$1,188	\$57	\$56		\$1,302
1997	\$1,047	\$94	\$50		\$1,191
1998	\$920	\$103	\$242		\$1,263
1999	\$1,140	\$151	\$84	\$0	\$1,375
2000	\$1,316	\$132	\$215	\$0	\$1,663
2001	\$1,253	\$98	\$88	\$0	\$1,439
2002	\$1,124	\$97	\$29	\$0	\$1,250
2003	\$741	\$111	\$79	\$1	\$931
2004	\$702	\$95	\$68	\$0	\$865
2005	\$542	\$69	\$44	\$1	\$656
2006	\$538	\$102	\$135	\$1	\$777
2007	\$1,093	\$114	\$114	\$1	\$1,324
2008	\$1,052	\$84	\$174	\$1	\$1,311
2009	\$900	\$78	\$112	\$1	\$1,090
2010	\$630	\$96	\$95	\$3	\$823
2011	\$862	\$190	\$172	\$1	\$1,224
2012	\$778	\$107	\$461	\$3	\$1,349
2013	\$566	\$116	\$221	\$1	\$904
2014	\$691	\$110	\$108	\$1	\$910
2015	\$1,175	\$120	\$376	\$12	\$1,683

Note: National estimates are projections. Casualty projections can be heavily influenced by the inclusion or exclusion of a small number of unusually serious fires. Because of low participation in NFIRS Version 5.0 during 1999-2001, estimates for those years must be used with caution. Dollar losses have been rounded to the nearest million dollars. Inflation adjustment to 2015 dollars is done using the consumer price index. Unknowns have been allocated proportionally.

Source: NFIRS and NFPA Fire Experience Survey.



**Table 2.**  
**Structure Fires in Industrial and Manufacturing Properties**  
**By Month, 2011-2015 Annual Averages**

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	720	(9%)	2	(22%)	22	(10%)	\$77	(10%)
February	660	(8%)	1	(8%)	19	(9%)	\$66	(8%)
March	700	(9%)	1	(11%)	19	(8%)	\$99	(12%)
April	700	(9%)	0	(4%)	19	(9%)	\$58	(7%)
May	660	(8%)	1	(14%)	22	(10%)	\$61	(8%)
June	660	(8%)	0	(2%)	15	(7%)	\$41	(5%)
July	640	(8%)	0	(5%)	18	(8%)	\$86	(11%)
August	640	(8%)	1	(11%)	14	(6%)	\$96	(12%)
September	580	(7%)	1	(10%)	17	(8%)	\$67	(8%)
October	630	(8%)	0	(3%)	16	(7%)	\$48	(6%)
November	620	(8%)	0	(0%)	17	(8%)	\$47	(6%)
December	560	(7%)	1	(11%)	21	(10%)	\$54	(7%)
<b>Total</b>	<b>7,770</b>	<b>(100%)</b>	<b>8</b>	<b>(100%)</b>	<b>219</b>	<b>(100%)</b>	<b>\$799</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS and NFPA Fire Experience Survey.

**Table 3.**  
**Structure Fires in Industrial and Manufacturing Properties**  
**By Day of Week, 2011-2015 Annual Averages**

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	770	(10%)	1	(8%)	12	(5%)	\$94	(12%)
Monday	1,150	(15%)	2	(27%)	27	(12%)	\$150	(19%)
Tuesday	1,260	(16%)	1	(13%)	47	(21%)	\$127	(16%)
Wednesday	1,270	(16%)	2	(21%)	34	(16%)	\$167	(21%)
Thursday	1,240	(16%)	1	(8%)	44	(20%)	\$75	(9%)
Friday	1,160	(15%)	1	(16%)	44	(20%)	\$85	(11%)
Saturday	910	(12%)	1	(7%)	12	(5%)	\$102	(13%)
<b>Total</b>	<b>7,770</b>	<b>(100%)</b>	<b>8</b>	<b>(100%)</b>	<b>219</b>	<b>(100%)</b>	<b>\$799</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS and NFPA Fire Experience Survey.

**Table 4.**  
**Structure Fires in Industrial and Manufacturing Properties**  
**By Time of Day, 2011-2015 Annual Averages**

Time of Day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight-12:59 a.m.	230	(3%)	0	(2%)	3	(1%)	\$43	(5%)
1:00-1:59 a.m.	220	(3%)	1	(10%)	2	(1%)	\$70	(9%)
2:00-2:59 a.m.	200	(3%)	0	(0%)	3	(2%)	\$12	(1%)
3:00-3:59 a.m.	210	(3%)	1	(7%)	1	(0%)	\$30	(4%)
4:00-4:59 a.m.	220	(3%)	0	(5%)	5	(2%)	\$24	(3%)
5:00-5:59 a.m.	240	(3%)	0	(0%)	3	(1%)	\$27	(3%)
6:00-6:59 a.m.	280	(4%)	1	(7%)	11	(5%)	\$14	(2%)
7:00-7:59 a.m.	330	(4%)	0	(3%)	9	(4%)	\$89	(11%)
8:00-8:59 a.m.	360	(5%)	0	(2%)	23	(10%)	\$14	(2%)
9:00-9:59 a.m.	380	(5%)	0	(0%)	19	(9%)	\$17	(2%)
10:00-10:59 a.m.	400	(5%)	1	(9%)	14	(6%)	\$23	(3%)
11:00-11:59 a.m.	410	(5%)	0	(6%)	17	(8%)	\$45	(6%)
12:00-12:59 p.m.	390	(5%)	0	(3%)	9	(4%)	\$32	(4%)
1:00-1:59 p.m.	420	(5%)	1	(9%)	19	(9%)	\$33	(4%)
2:00-2:59 p.m.	430	(6%)	1	(15%)	21	(10%)	\$35	(4%)
3:00-3:59 p.m.	420	(5%)	0	(0%)	13	(6%)	\$22	(3%)
4:00-4:59 p.m.	390	(5%)	0	(2%)	7	(3%)	\$39	(5%)
5:00-5:59 p.m.	380	(5%)	1	(9%)	4	(2%)	\$24	(3%)
6:00-6:59 p.m.	350	(5%)	0	(0%)	5	(2%)	\$82	(10%)
7:00-7:59 p.m.	350	(5%)	0	(0%)	9	(4%)	\$28	(3%)
8:00-8:59 p.m.	340	(4%)	0	(0%)	7	(3%)	\$33	(4%)
9:00-9:59 p.m.	300	(4%)	0	(2%)	5	(2%)	\$28	(3%)
10:00-10:59 p.m.	280	(4%)	0	(0%)	5	(2%)	\$20	(3%)
11:00-11:59 p.m.	240	(3%)	1	(9%)	4	(2%)	\$14	(2%)
<b>Total</b>	<b>7,770</b>	<b>(100%)</b>	<b>8</b>	<b>(100%)</b>	<b>219</b>	<b>(100%)</b>	<b>\$799</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS and NFPA Fire Experience Survey.

**Table 5.**  
**Structure Fires in Industrial Properties**  
**By Leading Cause, 2011-2015 Annual Averages**

Leading Cause	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Electrical distribution and lighting equipment	640	(24%)	2	(100%)	4	(9%)	\$142	(55%)
Heating equipment	420	(16%)	0	(0%)	7	(16%)	\$11	(4%)
Intentional	230	(9%)	0	(0%)	1	(1%)	\$3	(1%)
Cooking equipment	120	(4%)	0	(0%)	0	(0%)	\$0	(0%)
Torch, burner or soldering iron	100	(4%)	0	(0%)	12	(28%)	\$14	(5%)
Exposure fire	90	(3%)	0	(0%)	1	(2%)	\$14	(5%)
Lightning	60	(2%)	0	(0%)	0	(1%)	\$4	(2%)
Smoking materials	50	(2%)	0	(0%)	0	(0%)	\$0	(0%)

The causes in this table are drawn from multiple fields. The methodology used is described in [Appendix B](#).

Source: NFIRS and NFPA Fire Experience survey.

**Table 6.**  
**Structure Fires in Industrial Properties**  
**By Equipment Involved in Ignition, 2011-2015 Annual Averages**

<b>Equipment Involved in Ignition</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Electrical distribution and lighting equipment	640	(24%)	2	(100%)	4	(9%)	\$142	(55%)
Wiring and related equipment	360	(14%)	2	(100%)	4	(9%)	\$21	(8%)
Transformers and power supplies	180	(7%)	0	(0%)	0	(0%)	\$119	(46%)
Lamp, bulb or lighting	70	(2%)	0	(0%)	0	(0%)	\$1	(1%)
Cord or plug	20	(1%)	0	(0%)	0	(0%)	\$1	(0%)
Heating equipment	420	(16%)	0	(0%)	7	(16%)	\$11	(4%)
Heat lamp	130	(5%)	0	(0%)	1	(3%)	\$2	(1%)
Fixed or portable space heater	90	(4%)	0	(0%)	3	(6%)	\$4	(2%)
Confined fuel burner or boiler fire	90	(3%)	0	(0%)	0	(1%)	\$0	(0%)
Central heat	30	(1%)	0	(0%)	0	(0%)	\$1	(1%)
Confined chimney or flue fire	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Fireplace or chimney	20	(1%)	0	(0%)	3	(6%)	\$4	(1%)
Water heater	10	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known heating equipment	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
No equipment involved in ignition	390	(15%)	0	(0%)	4	(10%)	\$30	(12%)
Contained trash or rubbish fire	380	(14%)	0	(0%)	0	(1%)	\$0	(0%)
Cooking equipment	120	(4%)	0	(0%)	0	(0%)	\$0	(0%)
Confined cooking fire	97	(4%)	0	(0%)	0	(0%)	\$0	(0%)
Other known cooking equipment	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Torch, burner or soldering iron	100	(4%)	0	(0%)	12	(28%)	\$14	(5%)
Unclassified equipment involved in ignition	90	(3%)	0	(0%)	1	(3%)	\$6	(2%)
Fan	40	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Confined incinerator overload or malfunction fire	40	(1%)	0	(0%)	1	(2%)	\$0	(0%)
Conveyor	40	(1%)	0	(0%)	1	(3%)	\$6	(2%)
Confined commercial compactor fire	30	(1%)	0	(0%)	1	(3%)	\$0	(0%)
Hay processing equipment	30	(1%)	0	(0%)	0	(0%)	\$2	(1%)
Pump	30	(1%)	0	(0%)	0	(0%)	\$2	(1%)
Silo loader, unloader, or screw/sweep auger	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified laboratory equipment	20	(1%)	0	(0%)	1	(2%)	\$1	(1%)
Industrial furnace or kiln	20	(1%)	0	(0%)	0	(0%)	\$1	(0%)
Power sander, grinder, buffer, or polisher	20	(1%)	0	(0%)	0	(0%)	\$2	(1%)

**Table 6.**  
**Structure Fires in Industrial Properties**  
**By Equipment Involved in Ignition, 2011-2015 Annual Averages (Continued)**

Equipment Involved in Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Heat treating equipment	10	(1%)	0	(0%)	0	(0%)	\$17	(6%)
Other known equipment involved in ignition	250	(9%)	0	(0%)	10	(23%)	\$24	(9%)
<b>Total</b>	<b>2,690</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>43</b>	<b>(100%)</b>	<b>\$259</b>	<b>(100%)</b>

Note: Non-confined fires in which the equipment involved in ignition was unknown or not reported have been allocated proportionally among fires with known equipment involved. The same approach was used with confined cooking fires. Fires in which the equipment involved in ignition was entered as none but the heat source indicated equipment involvement or the heat source was unknown were also treated as unknown and allocated proportionally among fires with known equipment involved. Non-confined fires in which the equipment was partially unclassified (i.e., unclassified kitchen or cooking equipment, unclassified heating, cooling or air condition equipment, etc.) were allocated proportionally among fires in that grouping (kitchen or cooking equipment; heating, cooling or air conditioning equipment, etc.). The same approach was used with confined cooking fires. The estimates of fires involving fireplace or chimney include all fires with the confined chimney or flue incident type regardless of what may have been coded as equipment involved. Likewise, the estimates of fires involving furnaces, central heat or boilers include all fires with confined fuel burner or boiler incident type. The estimates shown should be considered upper bounds. Non-cooking confined fires were not analyzed separately. Estimates of other types of equipment exclude confined fires. Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS and NFPA Fire Experience Survey.

**Table 7.**  
**Structure Fires in Industrial Properties**  
**By Cause of Ignition, 2011-2015 Annual Averages**

Cause of Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unintentional	1,580	(59%)	2	(100%)	37	(85%)	\$119	(46%)
Non-confined	1,170	(43%)	2	(100%)	33	(77%)	\$118	(46%)
Confined	400	(15%)	0	(0%)	3	(7%)	\$0	(0%)
Failure of equipment or heat source	660	(25%)	0	(0%)	3	(7%)	\$112	(43%)
Non-confined	560	(21%)	0	(0%)	3	(7%)	\$111	(43%)
Confined	100	(4%)	0	(0%)	0	(0%)	\$1	(0%)
Intentional	230	(9%)	0	(0%)	1	(1%)	\$3	(1%)
Non-confined	90	(3%)	0	(0%)	1	(1%)	\$3	(1%)
Confined	140	(5%)	0	(0%)	0	(0%)	\$0	(0%)
Act of nature	140	(5%)	0	(0%)	2	(5%)	\$6	(2%)
Non-confined	130	(5%)	0	(0%)	2	(5%)	\$6	(2%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified cause	90	(3%)	0	(0%)	1	(2%)	\$19	(7%)
Non-confined	80	(3%)	0	(0%)	1	(2%)	\$19	(7%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
<b>Total</b>	<b>2,690</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>43</b>	<b>(100%)</b>	<b>\$259</b>	<b>(100%)</b>
Non-confined	2,020	(75%)	2	(100%)	40	(93%)	\$258	(99%)
Confined	670	(25%)	0	(0%)	3	(7%)	\$1	(1%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires other than chimney or flue fires (NFIRS incident type 113, and 115-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 8.**  
**Structure Fires in Industrial Properties**  
**By Factor Contributing to Ignition, 2011-2015 Annual Averages**

<b>Factor Contributing to Ignition</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Electrical failure or malfunction	530	(20%)	0	(0%)	4	(9%)	\$43	(17%)
Non-confined	500	(19%)	0	(0%)	4	(9%)	\$43	(17%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Mechanical failure or malfunction	460	(17%)	0	(0%)	3	(8%)	\$65	(25%)
Non-confined	340	(13%)	0	(0%)	3	(8%)	\$64	(25%)
Confined	120	(4%)	0	(0%)	0	(0%)	\$1	(0%)
Heat source too close to combustibles	260	(10%)	1	(48%)	11	(25%)	\$10	(4%)
Non-confined	240	(9%)	1	(48%)	11	(25%)	\$10	(4%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Outside/open fire for debris or waste disposal	170	(6%)	0	(0%)	0	(0%)	\$6	(2%)
Non-confined	70	(2%)	0	(0%)	0	(0%)	\$6	(2%)
Confined	100	(4%)	0	(0%)	0	(0%)	\$0	(0%)
Abandoned or discarded material or product	140	(5%)	0	(0%)	2	(4%)	\$2	(1%)
Non-confined	60	(2%)	0	(0%)	2	(4%)	\$2	(1%)
Confined	80	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Cutting or welding too close to combustibles	140	(5%)	0	(0%)	3	(8%)	\$7	(3%)
Non-confined	120	(4%)	0	(0%)	3	(8%)	\$7	(3%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified factor contributed to ignition	130	(5%)	0	(0%)	2	(6%)	\$83	(32%)
Non-confined	90	(3%)	0	(0%)	2	(6%)	\$83	(32%)
Confined	40	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified natural condition	90	(3%)	0	(0%)	3	(7%)	\$7	(3%)
Non-confined	70	(3%)	0	(0%)	3	(7%)	\$7	(3%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
High wind	90	(3%)	0	(0%)	2	(4%)	\$7	(3%)
Non-confined	70	(3%)	0	(0%)	2	(4%)	\$7	(3%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Exposure fire	90	(3%)	0	(0%)	1	(2%)	\$14	(5%)
Non-confined	80	(3%)	0	(0%)	1	(2%)	\$14	(5%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)



**Table 8.**  
**Structure Fires in Industrial Properties**  
**By Factor Contributing to Ignition, 2011-2015 Annual Averages (Continued)**

Factor Contributing to Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Rekindle	80	(3%)	0	(0%)	0	(0%)	\$1	(1%)
Non-confined	50	(2%)	0	(0%)	0	(0%)	\$1	(1%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified misuse of material or product	80	(3%)	0	(0%)	6	(13%)	\$2	(1%)
Non-confined	40	(1%)	0	(0%)	2	(6%)	\$2	(1%)
Confined	40	(1%)	0	(0%)	3	(7%)	\$0	(0%)
Storm	70	(3%)	0	(0%)	1	(1%)	\$3	(1%)
Non-confined	60	(2%)	0	(0%)	1	(1%)	\$3	(1%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Equipment unattended	60	(2%)	0	(0%)	1	(2%)	\$1	(0%)
Non-confined	30	(1%)	0	(0%)	1	(2%)	\$1	(0%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified operational deficiency	50	(2%)	0	(0%)	1	(2%)	\$1	(0%)
Non-confined	30	(1%)	0	(0%)	1	(2%)	\$1	(0%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified fire spread or control	50	(2%)	0	(0%)	0	(0%)	\$7	(3%)
Non-confined	30	(1%)	0	(0%)	0	(0%)	\$7	(3%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Failure to clean	40	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Non-confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known factor contributing to ignition	280	(11%)	1	(53%)	10	(12%)	\$14	(5%)
Non-confined	190	(7%)	1	(53%)	10	(12%)	\$14	(5%)
Confined	100	(4%)	0	(0%)	0	(0%)	\$0	(0%)
<b>Total fires</b>	<b>2,690</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>43</b>	<b>(100%)</b>	<b>\$259</b>	<b>(100%)</b>
Non-confined	2,020	(75%)	2	(100%)	40	(93%)	\$258	(100%)
Confined	670	(25%)	0	(0%)	0	(7%)	\$1	(0%)
<b>Total factors</b>	<b>2,800</b>	<b>(104%)</b>	<b>2</b>	<b>(100%)</b>	<b>44</b>	<b>(101%)</b>	<b>\$273</b>	<b>(105%)</b>
Non-confined	2,100	(78%)	2	(100%)	41	(94%)	\$272	(105%)
Confined	700	(26%)	0	(0%)	3	(7%)	\$1	(0%)

Note: Multiple entries are allowed which can result in sums higher than totals. Fires in which the factor contributing to ignition was coded as “none,” “unknown”, or “not reported” have been allocated proportionally among fires with known factor contributing to ignition. Confined structure fires (NFIRS incident type 113-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 9.  
Structure Fires in Industrial Properties  
By Heat Source, 2011-2015 Annual Averages**

<b>Heat Source</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Unclassified heat from powered equipment	370	(14%)	0	(0%)	4	(8%)	\$34	(13%)
Non-confined	360	(14%)	0	(0%)	4	(8%)	\$34	(13%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Arcing	350	(13%)	0	(0%)	1	(3%)	\$78	(30%)
Non-confined	270	(10%)	0	(0%)	1	(3%)	\$78	(30%)
Confined	80	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Radiated or conducted heat from operating equipment	320	(12%)	0	(0%)	6	(14%)	\$21	(8%)
Non-confined	230	(8%)	0	(0%)	6	(14%)	\$20	(8%)
Confined	90	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Spark, ember or flame from operating equipment	230	(9%)	1	(30%)	11	(26%)	\$21	(8%)
Non-confined	170	(6%)	1	(30%)	11	(26%)	\$21	(8%)
Confined	60	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified hot or smoldering object	230	(8%)	0	(26%)	2	(5%)	\$11	(4%)
Non-confined	160	(6%)	0	(26%)	1	(2%)	\$11	(4%)
Confined	60	(2%)	0	(0%)	1	(3%)	\$0	(0%)
Unclassified heat source	200	(8%)	0	(0%)	3	(7%)	\$14	(5%)
Non-confined	130	(5%)	0	(0%)	1	(3%)	\$14	(5%)
Confined	70	(3%)	0	(0%)	2	(4%)	\$0	(0%)
Radiated heat from another fire	180	(7%)	0	(0%)	1	(3%)	\$23	(9%)
Non-confined	130	(5%)	0	(0%)	1	(3%)	\$23	(9%)
Confined	50	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Molten or hot material	90	(3%)	0	(0%)	4	(9%)	\$3	(1%)
Non-confined	70	(2%)	0	(0%)	4	(9%)	\$3	(1%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Heat or spark from friction	90	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Non-confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Confined	60	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Heat from direct flame or convection currents	70	(2%)	0	(0%)	3	(7%)	\$1	(0%)
Non-confined	50	(2%)	0	(0%)	3	(7%)	\$1	(0%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)

**Table 9.**  
**Structure Fires in Industrial Properties**  
**By Heat Source, 2011-2015 Annual Averages (Continued)**

<b>Heat Source</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Flame or torch used for lighting	70	(2%)	0	(0%)	1	(3%)	\$2	(1%)
Non-confined	50	(2%)	0	(0%)	1	(3%)	\$2	(1%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Heat or spark from friction	60	(2%)	0	(0%)	2	(5%)	\$6	(2%)
Non-confined	50	(2%)	0	(0%)	2	(5%)	\$6	(2%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Lightning	60	(2%)	0	(0%)	0	(1%)	\$4	(2%)
Non-confined	60	(2%)	0	(0%)	0	(1%)	\$4	(2%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Cigarette lighter	60	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Non-confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Flying brand, ember or spark	60	(2%)	0	(0%)	0	(0%)	\$3	(1%)
Non-confined	50	(2%)	0	(0%)	0	(0%)	\$2	(1%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Heat from direct flame or convection currents	50	(2%)	0	(0%)	1	(2%)	\$13	(5%)
Non-confined	50	(2%)	0	(0%)	1	(2%)	\$13	(5%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Smoking materials	50	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Non-confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known heat source	160	(6%)	1	(44%)	3	(7%)	\$24	(9%)
Non-confined	130	(5%)	1	(44%)	3	(7%)	\$24	(9%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
<b>Total</b>	<b>2,690</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>43</b>	<b>(100%)</b>	<b>\$259</b>	<b>(100%)</b>
Non-confined	2,020	(75%)	2	(100%)	40	(93%)	\$258	(100%)
Confined	670	(25%)	0	(0%)	3	(7%)	\$1	(0%)

Note: Sums may not equal totals due to rounding errors. The statistics on matches, lighters, smoking materials and candles include a proportional share of fires in which the heat source was heat from an unclassified open flame or smoking material. Confined structure fires (NFIRS incident type 113-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 10.**  
**Structure Fires in Industrial Properties**  
**By Area of Origin, 2011-2015 Annual Averages**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified outside area	190	(7%)	0	(10%)	1	(2%)	\$4	(1%)
Non-confined	100	(4%)	0	(10%)	1	(2%)	\$4	(1%)
Confined	90	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified storage area	190	(7%)	0	(0%)	3	(6%)	\$66	(25%)
Non-confined	180	(7%)	0	(0%)	3	(6%)	\$66	(25%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified equipment or service area	180	(7%)	0	(17%)	4	(10%)	\$28	(11%)
Non-confined	150	(6%)	0	(17%)	4	(10%)	\$28	(11%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified area of origin	170	(6%)	0	(0%)	0	(0%)	\$5	(2%)
Non-confined	130	(5%)	0	(0%)	0	(0%)	\$5	(2%)
Confined	40	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified structural area	140	(5%)	0	(17%)	1	(2%)	\$13	(5%)
Non-confined	130	(5%)	0	(17%)	1	(2%)	\$13	(5%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Lawn, field or open area	130	(5%)	0	(0%)	1	(1%)	\$1	(1%)
Non-confined	60	(2%)	0	(0%)	1	(1%)	\$1	(1%)
Confined	70	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Storage room, area, tank, or bin	110	(4%)	0	(0%)	3	(7%)	\$8	(3%)
Non-confined	100	(4%)	0	(0%)	1	(3%)	\$8	(3%)
Confined	20	(1%)	0	(0%)	2	(4%)	\$0	(0%)
Processing or manufacturing area, or workroom	110	(4%)	0	(11%)	8	(18%)	\$12	(4%)
Non-confined	80	(3%)	0	(11%)	6	(15%)	\$11	(4%)
Confined	30	(1%)	0	(0%)	1	(3%)	\$1	(0%)
Machinery room or area or elevator machinery room	100	(4%)	0	(0%)	3	(7%)	\$7	(3%)
Non-confined	80	(3%)	0	(0%)	3	(7%)	\$7	(3%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Switchgear area or transformer vault	90	(3%)	0	(0%)	3	(6%)	\$22	(8%)
Non-confined	80	(3%)	0	(0%)	3	(6%)	\$22	(8%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)

**Table 10.**  
**Structure Fires in Industrial Properties**  
**By Area of Origin, 2011-2015 Annual Averages (Continued)**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Exterior wall surface	80	(3%)	0	(0%)	0	(0%)	\$8	(3%)
Non-confined	80	(3%)	0	(0%)	0	(0%)	\$8	(3%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Trash or rubbish chute, area or container	80	(3%)	0	(0%)	0	(0%)	\$4	(2%)
Non-confined	10	(0%)	0	(0%)	0	(0%)	\$4	(2%)
Confined	70	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Laboratory	70	(3%)	0	(0%)	4	(9%)	\$3	(1%)
Non-confined	50	(2%)	0	(0%)	4	(9%)	\$3	(1%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Wall assembly or concealed space	70	(3%)	0	(0%)	0	(0%)	\$3	(1%)
Non-confined	70	(3%)	0	(0%)	0	(0%)	\$3	(1%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Exterior roof surface	60	(2%)	0	(0%)	1	(1%)	\$4	(1%)
Non-confined	60	(2%)	0	(0%)	1	(1%)	\$4	(1%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Heating equipment room	60	(2%)	0	(14%)	0	(0%)	\$4	(2%)
Non-confined	40	(1%)	0	(14%)	0	(0%)	\$4	(2%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Wildland area or woods	60	(2%)	0	(0%)	0	(1%)	\$0	(0%)
Non-confined	10	(0%)	0	(0%)	0	(1%)	\$0	(0%)
Confined	50	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified function area	50	(2%)	0	(17%)	1	(1%)	\$3	(1%)
Non-confined	40	(2%)	0	(17%)	1	(1%)	\$3	(1%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Conduit, pipe, utility, or ventilation shaft	50	(2%)	0	(0%)	3	(7%)	\$1	(0%)
Non-confined	40	(1%)	0	(0%)	3	(7%)	\$1	(0%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Kitchen or cooking area	50	(2%)	0	(0%)	1	(1%)	\$1	(0%)
Non-confined	10	(0%)	0	(0%)	1	(1%)	\$1	(0%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Maintenance or paint shop or area	50	(2%)	0	(0%)	1	(3%)	\$3	(1%)
Non-confined	40	(2%)	0	(0%)	1	(3%)	\$3	(1%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)

**Table 10.**  
**Structure Fires in Industrial Properties**  
**By Area of Origin, 2011-2015 Annual Averages (Continued)**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Ceiling/floor assembly or concealed space	40	(2%)	0	(0%)	0	(0%)	\$1	(0%)
Non-confined	40	(2%)	0	(0%)	0	(0%)	\$1	(0%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Confined chimney or flue fire	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known area of origin	520	(19%)	0	(14%)	7	(17%)	\$50	(19%)
Non-confined	410	(15%)	0	(14%)	7	(17%)	\$50	(19%)
Confined	110	(4%)	0	(0%)	0	(0%)	\$0	(0%)
<b>Total</b>	<b>2,690</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>43</b>	<b>(100%)</b>	<b>\$259</b>	<b>(100%)</b>
Non-confined	2,020	(75%)	2	(100%)	40	(93%)	\$258	(100%)
Confined	670	(25%)	0	(0%)	3	(7%)	\$1	(0%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires other than chimney or flue fires (NFIRS incident type 113, and 115-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 11.  
Structure Fires in Industrial Properties,  
By Item First Ignited, 2011-2015 Annual Averages**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Agricultural crop, including fruits and vegetables	250	(9%)	0	(0%)	1	(2%)	\$12	(5%)
Non-confined	220	(8%)	0	(0%)	1	(2%)	\$12	(5%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Flammable or combustible liquids or gases, piping or filter	240	(9%)	1	(39%)	18	(42%)	\$57	(22%)
Non-confined	170	(6%)	1	(39%)	18	(42%)	\$57	(22%)
Confined	70	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Electrical wire or cable insulation	230	(9%)	0	(0%)	2	(4%)	\$28	(11%)
Non-confined	220	(8%)	0	(0%)	2	(4%)	\$28	(11%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Rubbish, trash, or waste	220	(8%)	0	(0%)	0	(0%)	\$8	(3%)
Non-confined	40	(1%)	0	(0%)	0	(0%)	\$8	(3%)
Confined	180	(7%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified item first ignited	200	(8%)	0	(0%)	2	(5%)	\$58	(22%)
Non-confined	150	(6%)	0	(0%)	2	(5%)	\$58	(22%)
Confined	50	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Structural member or framing	180	(7%)	0	(0%)	3	(7%)	\$9	(4%)
Non-confined	180	(7%)	0	(0%)	3	(7%)	\$9	(4%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified organic materials	160	(6%)	0	(0%)	5	(12%)	\$6	(2%)
Non-confined	110	(4%)	0	(0%)	2	(4%)	\$6	(2%)
Confined	50	(2%)	0	(0%)	3	(7%)	\$0	(0%)
Light vegetation including grass	140	(5%)	0	(0%)	1	(3%)	\$5	(2%)
Non-confined	90	(3%)	0	(0%)	1	(3%)	\$5	(2%)
Confined	40	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Exterior wall covering or finish	110	(4%)	0	(0%)	0	(0%)	\$15	(6%)
Non-confined	110	(4%)	0	(0%)	0	(0%)	\$15	(6%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Dust, fiber, lint, including sawdust or excelsior	80	(3%)	0	(0%)	2	(4%)	\$7	(3%)
Non-confined	60	(2%)	0	(0%)	2	(4%)	\$7	(3%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Exterior roof covering or finish	70	(3%)	0	(0%)	0	(1%)	\$5	(2%)
Non-confined	70	(3%)	0	(0%)	0	(1%)	\$5	(2%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)

**Table 11.**  
**Structure Fires in Industrial Properties**  
**By Item First Ignited, 2011-2015 Annual Averages (Continued)**

Item First Ignited	Fires		Civilian		Civilian		Direct	
			Deaths	Injuries	Property Damage	(in Millions)		
Unclassified structural component or finish	70	(2%)	0	(0%)	1	(1%)	\$11	(4%)
Non-confined	60	(2%)	0	(0%)	1	(1%)	\$11	(4%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Multiple items first ignited	60	(2%)	0	(25%)	0	(0%)	\$3	(1%)
Non-confined	40	(1%)	0	(25%)	0	(0%)	\$3	(1%)
Confined	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Insulation within structural area	60	(2%)	0	(0%)	0	(0%)	\$8	(3%)
Non-confined	60	(2%)	0	(0%)	0	(0%)	\$8	(3%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Interior wall covering, excluding drapes	50	(2%)	0	(0%)	0	(1%)	\$2	(1%)
Non-confined	50	(2%)	0	(0%)	0	(1%)	\$2	(1%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Cooking materials, including food	50	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Non-confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Confined	40	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Fence or pole	50	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Non-confined	40	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Heavy vegetation including trees	40	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Non-confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Transformer or transformer fluids	40	(2%)	0	(0%)	0	(0%)	\$9	(3%)
Non-confined	40	(2%)	0	(0%)	0	(0%)	\$9	(3%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Other known item first ignited	390	(14%)	1	(36%)	8	(18%)	\$16	(6%)
Non-confined	270	(10%)	1	(36%)	8	(18%)	\$15	(6%)
Confined	110	(4%)	0	(0%)	0	(0%)	\$0	(0%)
<b>Total</b>	<b>2,690</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>43</b>	<b>(100%)</b>	<b>\$259</b>	<b>(100%)</b>
Non-confined	2,020	(75%)	2	(100%)	40	(93%)	\$258	(100%)
Confined	670	(25%)	0	(0%)	3	(7%)	\$1	(0%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident type 113-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.



**Table 12.**  
**Structure Fires in Industrial Properties**  
**By Extent of Flame Spread, 2011-2015 Annual Averages**

Extent of Flame Spread	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	670	(25%)	0	(0%)	3	(7%)	\$1	(0%)
Confined to object of origin	410	(20%)	0	(0%)	8	(19%)	\$68	(26%)
Confined to room of origin	390	(19%)	0	(11%)	15	(36%)	\$36	(14%)
Confined to floor of origin	120	(6%)	0	(0%)	3	(9%)	\$3	(1%)
Confined to building of origin	860	(43%)	1	(36%)	9	(23%)	\$113	(44%)
Beyond building of origin	230	(12%)	1	(52%)	5	(13%)	\$38	(15%)
<b>Total</b>	<b>2,690</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>43</b>	<b>(100%)</b>	<b>\$259</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 13.**  
**Structure Fires in Manufacturing Properties**  
**By Leading Cause, 2011-2015 Annual Averages**

Leading Cause	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Heating equipment	780	(15%)	0	(0%)	15	(9%)	\$21	(4%)
Electrical distribution and lighting equipment	380	(8%)	0	(0%)	12	(7%)	\$39	(7%)
Torch, burner or soldering iron	300	(6%)	1	(24%)	19	(11%)	\$39	(7%)
Cooking equipment	290	(6%)	0	(0%)	3	(2%)	\$15	(3%)
Intentional	150	(3%)	0	(0%)	0	(2%)	\$0	(1%)
Exposure fire	90	(2%)	0	(0%)	0	(0%)	\$16	(3%)

The causes in this table are drawn from multiple fields. The methodology used is described in [Appendix B](#).

Source: NFIRS and NFPA Fire Experience survey.

**Table 14.**  
**Structure Fires in Manufacturing Properties, by Equipment Involved in Ignition**  
**2011-2015 Annual Averages**

<b>Equipment Involved</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Heating equipment	780	(15%)	0	(0%)	15	(9%)	\$21	(4%)
Confined chimney or flue fire	260	(5%)	0	(0%)	5	(3%)	\$1	(0%)
Confined fuel burner or boiler fire	190	(4%)	0	(0%)	3	(2%)	\$1	(0%)
Fixed or portable space heater	160	(3%)	0	(0%)	1	(0%)	\$8	(2%)
Central heat	60	(1%)	0	(0%)	1	(1%)	\$5	(1%)
Fireplace or chimney	40	(1%)	0	(0%)	0	(0%)	\$1	(0%)
Other known heating equipment	50	(1%)	0	(0%)	5	(3%)	\$5	(1%)
No equipment involved in ignition	440	(9%)	2	(25%)	33	(19%)	\$43	(8%)
Contained trash or rubbish fire	410	(8%)	0	(0%)	2	(1%)	\$0	(0%)
Electrical distribution and lighting equipment	380	(8%)	0	(0%)	12	(7%)	\$39	(7%)
Wiring and related equipment	230	(4%)	0	(0%)	7	(4%)	\$24	(4%)
Transformers and power supplies	70	(1%)	0	(0%)	4	(2%)	\$8	(1%)
Lamp, bulb or lighting	60	(1%)	0	(0%)	0	(0%)	\$7	(1%)
Other known electrical distribution or lighting equipment	20	(0%)	0	(0%)	1	(0%)	\$1	(0%)
Torch, burner or soldering iron	300	(6%)	1	(24%)	19	(11%)	\$39	(7%)
Cooking equipment	290	(6%)	0	(0%)	3	(2%)	\$15	(3%)
Confined cooking fire	230	(5%)	0	(0%)	1	(1%)	\$1	(0%)
Other known cooking equipment	60	(1%)	0	(0%)	1	(1%)	\$15	(3%)
Unclassified equipment involved in ignition	240	(5%)	0	(0%)	6	(3%)	\$26	(5%)
Heat treating equipment	190	(4%)	0	(0%)	16	(9%)	\$12	(2%)
Confined commercial compactor fire	170	(3%)	0	(0%)	1	(1%)	\$0	(0%)
Confined incinerator overload or malfunction fire	150	(3%)	0	(0%)	0	(0%)	\$1	(0%)
Industrial furnace or kiln	150	(3%)	0	(6%)	5	(3%)	\$25	(5%)
Casting, molding, or forging equipment	130	(3%)	0	(0%)	4	(2%)	\$102	(19%)
Fan	130	(3%)	0	(0%)	1	(0%)	\$6	(1%)
Conveyor	110	(2%)	0	(0%)	9	(5%)	\$9	(2%)
Power sander, grinder, buffer, or polisher	110	(2%)	0	(0%)	2	(1%)	\$7	(1%)
Air compressor	90	(2%)	1	(9%)	8	(4%)	\$76	(14%)
Extractor or waste recovery machine	90	(2%)	0	(0%)	3	(1%)	\$10	(2%)

**Table 14.**  
**Structure Fires in Manufacturing Properties, by Equipment Involved in Ignition**  
**2011-2015 Annual Averages (Continued)**

Equipment Involved	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Power cutting tool	70	(1%)	0	(0%)	0	(0%)	\$7	(1%)
Unclassified hydraulic equipment	70	(1%)	0	(0%)	13	(7%)	\$8	(2%)
Power saw	60	(1%)	0	(0%)	3	(1%)	\$7	(1%)
Printing press	50	(1%)	0	(0%)	2	(1%)	\$9	(2%)
Motor - separate	50	(1%)	1	(13%)	0	(0%)	\$1	(0%)
Power lathe	50	(1%)	0	(0%)	0	(0%)	\$3	(1%)
Drilling machinery or equipment	50	(1%)	0	(0%)	1	(1%)	\$0	(0%)
Unclassified laboratory equipment	40	(1%)	0	(6%)	0	(0%)	\$6	(1%)
Power shaper, router, jointer, or planer	40	(1%)	0	(0%)	0	(0%)	\$7	(1%)
Coating machine, including asphalt-saturating	30	(1%)	0	(0%)	1	(1%)	\$2	(0%)
Pump	30	(1%)	0	(0%)	2	(1%)	\$15	(3%)
Air conditioner	30	(1%)	0	(0%)	0	(0%)	\$1	(0%)
Other known equipment involved in ignition	370	(7%)	1	(17%)	16	(9%)	\$40	(7%)
<b>Total</b>	<b>5,080</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>176</b>	<b>(100%)</b>	<b>\$540</b>	<b>(100%)</b>

Note: Non-confined fires in which the equipment involved in ignition was unknown or not reported have been allocated proportionally among fires with known equipment involved. The same approach was used with confined cooking fires. Fires in which the equipment involved in ignition was entered as none but the heat source indicated equipment involvement or the heat source was unknown were also treated as unknown and allocated proportionally among fires with known equipment involved. Non-confined fires in which the equipment was partially unclassified (i.e., unclassified kitchen or cooking equipment, unclassified heating, cooling or air condition equipment, etc.) were allocated proportionally among fires in that grouping (kitchen or cooking equipment; heating, cooling or air conditioning equipment, etc.). The same approach was used with confined cooking fires. The estimates of fires involving fireplace or chimney include all fires with the confined chimney or flue incident type regardless of what may have been coded as equipment involved. Likewise, the estimates of fires involving furnaces, central heat or boilers include all fires with confined fuel burner or boiler incident type. The estimates shown should be considered upper bounds. Non-cooking confined fires were not analyzed separately. Estimates of other types of equipment exclude confined fires. Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS and NFPA Fire Experience Survey.

**Table 15.**  
**Structure Fires in Manufacturing Properties, by Cause of Ignition**  
**2011-2015 Annual Averages**

Cause of Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unintentional	3,330	(59%)	5	(75%)	129	(74%)	\$362	(67%)
Non-confined	2,340	(43%)	2	(75%)	118	(67%)	\$359	(67%)
Confined	980	(15%)	0	(0%)	11	(6%)	\$3	(0%)
Failure of equipment or heat source	1,460	(29%)	2	(25%)	43	(24%)	\$157	(29%)
Non-confined	1,100	(22%)	2	(0%)	42	(24%)	\$155	(29%)
Confined	360	(7%)	0	(0%)	1	(1%)	\$1	(0%)
Intentional	150	(3%)	0	(0%)	3	(2%)	\$6	(1%)
Non-confined	100	(2%)	0	(0%)	2	(1%)	\$6	(1%)
Confined	50	(1%)	0	(0%)	1	(1%)	\$0	(0%)
Unclassified cause	90	(2%)	0	(0%)	0	(0%)	\$13	(2%)
Non-confined	70	(1%)	0	(0%)	0	(0%)	\$13	(2%)
Confined	20	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Act of nature	60	(1%)	0	(0%)	1	(0%)	\$3	(1%)
Non-confined	40	(1%)	0	(0%)	1	(0%)	\$3	(1%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
<b>Total</b>	<b>5,080</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>176</b>	<b>(100%)</b>	<b>\$540</b>	<b>(100%)</b>
Non-confined	3,660	(72%)	6	(100%)	163	(93%)	\$536	(99%)
Confined	1,430	(28%)	0	(0%)	13	(7%)	\$4	(1%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires other than chimney or flue fires (NFIRS incident type 113, and 115-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 16.**  
**Structure Fires in Manufacturing Properties**  
**By Factor Contributing to Ignition, 2011-2015 Annual Averages**

Factor Contributing to Ignition	Fires		Civilian		Civilian		Direct	
			Deaths	Injuries	Property Damage	(in Millions)		
Mechanical failure or malfunction	1,400	(28%)	4	(68%)	55	(31%)	\$118	(22%)
Non-confined	1,040	(20%)	4	(68%)	53	(30%)	\$117	(22%)
Confined	360	(8%)	0	(0%)	2	(1%)	\$1	(0%)
Electrical failure or malfunction	670	(13%)	0	(5%)	16	(9%)	\$67	(12%)
Non-confined	590	(12%)	0	(0%)	16	(9%)	\$67	(12%)
Confined	80	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Failure to clean	560	(11%)	1	(10%)	16	(9%)	\$29	(5%)
Non-confined	310	(6%)	1	(10%)	13	(8%)	\$28	(5%)
Confined	250	(5%)	0	(0%)	3	(2%)	\$2	(0%)
Cutting or welding too close to combustibles	370	(7%)	1	(18%)	12	(7%)	\$42	(8%)
Non-confined	310	(6%)	1	(18%)	12	(7%)	\$42	(8%)
Confined	60	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Heat source too close to combustibles	350	(7%)	0	(0%)	12	(7%)	\$45	(8%)
Non-confined	280	(5%)	0	(0%)	12	(7%)	\$45	(8%)
Confined	80	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified factor contributing to ignition	260	(5%)	1	(10%)	3	(2%)	\$16	(3%)
Non-confined	180	(4%)	1	(10%)	3	(2%)	\$16	(3%)
Confined	80	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Abandoned or discarded material or product	250	(5%)	0	(0%)	1	(1%)	\$21	(4%)
Non-confined	120	(2%)	0	(0%)	1	(1%)	\$20	(4%)
Confined	130	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified operational deficiency	180	(4%)	0	(6%)	7	(4%)	\$63	(12%)
Non-confined	120	(2%)	0	(6%)	7	(4%)	\$63	(12%)
Confined	50	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified misuse of material or product	120	(2%)	0	(0%)	7	(4%)	\$4	(1%)
Non-confined	80	(2%)	0	(0%)	5	(3%)	\$4	(1%)
Confined	40	(1%)	0	(0%)	2	(1%)	\$0	(0%)

**Table 16.**  
**Structure Fires in Manufacturing Properties**  
**By Factor Contributing to Ignition, 2011-2015 Annual Averages (Continued)**

Factor Contributing to Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage	
							(in Millions)	
Improper container or storage	120	(3%)	0	(0%)	24	(14%)	\$8	(1%)
Non-confined	80	(2%)	0	(0%)	18	(10%)	\$8	(1%)
Confined	50	(1%)	0	(0%)	6	(3%)	\$0	(0%)
Rekindle	110	(2%)	0	(0%)	0	(0%)	\$2	(5%)
Non-confined	90	(2%)	0	(0%)	0	(0%)	\$2	(5%)
Confined	20	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Equipment unattended	90	(2%)	0	(0%)	0	(0%)	\$5	(1%)
Non-confined	50	(1%)	0	(0%)	0	(0%)	\$5	(1%)
Confined	40	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Exposure fire	90	(2%)	0	(0%)	1	(2%)	\$16	(3%)
Non-confined	90	(2%)	0	(0%)	1	(2%)	\$16	(3%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Equipment overloaded	90	(2%)	0	(0%)	0	(0%)	\$1	(0%)
Non-confined	40	(1%)	0	(0%)	0	(0%)	\$1	(0%)
Confined	40	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Equipment not being operated properly	80	(2%)	0	(0%)	2	(1%)	\$1	(0%)
Non-confined	50	(1%)	0	(0%)	2	(1%)	\$1	(0%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Other known factor contributing to ignition	540	(11%)	1	(19%)	30	(17%)	\$122	(23%)
Non-confined	380	(7%)	1	(19%)	30	(17%)	\$122	(23%)
Confined	160	(3%)	0	(0%)	0	(0%)	\$0	(0%)
<b>Total fires</b>	<b>5,080</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>176</b>	<b>(100%)</b>	<b>\$540</b>	<b>(100%)</b>
Non-confined	3,660	(72%)	6	(100%)	163	(93%)	\$536	(99%)
Confined	1,430	(28%)	0	(0%)	13	(7%)	\$4	(1%)
<b>Total factors</b>	<b>5,290</b>	<b>(104%)</b>	<b>8</b>	<b>(136%)</b>	<b>186</b>	<b>(106%)</b>	<b>\$587</b>	<b>(109%)</b>
Non-confined	3,820	(75%)	8	(136%)	173	(99%)	\$583	(108%)
Confined	1,470	(29%)	0	(0%)	13	(7%)	\$4	(1%)

Note: Multiple entries are allowed which can result in sums higher than totals. Fires in which the factor contributing to ignition was coded as “none,” “unknown”, or “not reported” have been allocated proportionally among fires with known factor contributing to ignition. Confined structure fires (NFIRS incident type 113-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 17.  
Structure Fires in Manufacturing Properties  
By Heat Source, 2011-2015 Annual Averages**

Heat Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified heat from powered equipment	930	(18%)	0	(6%)	30	(17%)	\$127	(24%)
Non-confined	670	(13%)	0	(6%)	24	(14%)	\$34	(23%)
Confined	250	(5%)	0	(0%)	6	(3%)	\$0	(0%)
Radiated or conducted heat from operating equipment	800	(16%)	0	(5%)	18	(10%)	\$64	(12%)
Non-confined	540	(8%)	0	(5%)	15	(14%)	\$63	(12%)
Confined	260	(3%)	0	(0%)	2	(0%)	\$1	(0%)
Spark, ember or flame from operating equipment	750	(15%)	0	(6%)	25	(14%)	\$57	(11%)
Non-confined	560	(11%)	0	(6%)	25	(15%)	\$57	(11%)
Confined	190	(4%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified hot or smoldering object	410	(8%)	0	(0%)	7	(4%)	\$22	(4%)
Non-confined	260	(5%)	0	(0%)	7	(4%)	\$22	(4%)
Confined	150	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Arcing	360	(8%)	1	(9%)	11	(6%)	\$53	(10%)
Non-confined	340	(5%)	1	(9%)	11	(6%)	\$53	(10%)
Confined	20	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Molten or hot material	300	(6%)	1	(20%)	16	(9%)	\$24	(5%)
Non-confined	220	(4%)	1	(20%)	16	(9%)	\$24	(4%)
Confined	90	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Heat or spark from friction	280	(5%)	1	(13%)	9	(5%)	\$16	(3%)
Non-confined	220	(4%)	1	(13%)	9	(5%)	\$16	(3%)
Confined	60	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Heat ember or ash	280	(5%)	0	(0%)	5	(3%)	\$82	(15%)
Non-confined	190	(4%)	0	(0%)	4	(2%)	\$82	(15%)
Confined	90	(2%)	0	(0%)	1	(1%)	\$0	(0%)



**Table 17.**  
**Structure Fires in Manufacturing Properties**  
**By Heat Source, 2011-2015 Annual Averages (Continued)**

Heat Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
			Count	(%)	Count	(%)	Count	(%)
Unclassified heat source	230	(5%)	0	(4%)	5	(3%)	\$18	(3%)
Non-confined	140	(3%)	0	(4%)	4	(2%)	\$18	(3%)
Confined	90	(2%)	0	(0%)	1	(1%)	\$0	(0%)
Spontaneous combustion or chemical reaction	200	(4%)	1	(24%)	22	(12%)	\$12	(2%)
Non-confined	130	(3%)	1	(24%)	22	(12%)	\$12	(2%)
Confined	70	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Flame or torch used for lighting	90	(2%)	0	(0%)	2	(1%)	\$6	(1%)
Non-confined	70	(1%)	0	(0%)	2	(1%)	\$6	(1%)
Confined	20	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Other known heat source	460	(9%)	1	(9%)	30	(7%)	\$56	(10%)
Non-confined	330	(6%)	1	(9%)	20	(7%)	\$56	(10%)
Confined	130	(3%)	0	(0%)	0	(1%)	\$0	(0%)
<b>Total</b>	<b>5,080</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>176</b>	<b>(100%)</b>	<b>\$540</b>	<b>(100%)</b>
Non-confined	3,660	(72%)	6	(100%)	163	(93%)	\$536	(99%)
Confined	1,430	(28%)	0	(0%)	13	(7%)	\$4	(1%)

Note: Sums may not equal totals due to rounding errors. The statistics on matches, lighters, smoking materials and candles include a proportional share of fires in which the heat source was heat from an unclassified open flame or smoking material. Confined structure fires (NFIRS incident type 113-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 18.**  
**Structure Fires in Manufacturing Properties**  
**By Area of Origin, 2011-2015 Annual Averages**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Processing or manufacturing area, or workroom	1,190	(23%)	2	(40%)	71	(40%)	\$154	(28%)
Non-confined	950	(19%)	2	(40%)	66	(38%)	\$153	(28%)
Confined	240	(5%)	0	(0%)	4	(3%)	\$1	(0%)
Unclassified equipment or service area	430	(8%)	1	(8%)	12	(7%)	\$54	(14%)
Non-confined	320	(6%)	1	(8%)	11	(6%)	\$53	(14%)
Confined	110	(2%)	0	(0%)	1	(1%)	\$0	(0%)
Machinery room or area or elevator machinery room	390	(6%)	0	(7%)	12	(7%)	\$32	(6%)
Non-confined	330	(5%)	8	(7%)	12	(7%)	\$32	(6%)
Confined	60	(1%)	0	(0%)	1	(1%)	\$0	(0%)
Trash or rubbish chute, area or container	190	(4%)	0	(2%)	3	(2%)	\$2	(0%)
Non-confined	50	(4%)	0	(2%)	2	(1%)	\$1	(0%)
Confined	140	(0%)	0	(0%)	1	(1%)	\$1	(0%)
Maintenance or paint shop area	190	(4%)	0	(0%)	11	(7%)	\$12	(2%)
Non-confined	150	(3%)	0	(0%)	11	(6%)	\$12	(2%)
Confined	30	(1%)	0	(0%)	1	(1%)	\$0	(0%)
Duct for HVAC, cable, exhaust, heating or air conditioning	180	(4%)	0	(0%)	2	(1%)	\$5	(1%)
Non-confined	150	(3%)	0	(0%)	2	(1%)	\$5	(1%)
Confined	30	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Storage room, area, tank, or bin	150	(3%)	0	(4%)	14	(8%)	\$22	(4%)
Non-confined	130	(3%)	0	(4%)	14	(8%)	\$22	(4%)
Confined	20	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Exterior roof surface	140	(3%)	0	(0%)	1	(1%)	\$11	(2%)
Non-confined	130	(3%)	0	(0%)	1	(1%)	\$11	(2%)
Confined	0	(4%)	0	(0%)	0	(2%)	\$0	(0%)
Unclassified technical processing area	130	(3%)	0	(3%)	5	(3%)	\$19	(4%)
Non-confined	110	(2%)	0	(3%)	5	(3%)	\$19	(3%)
Confined	20	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Shipping, receiving, or loading area	130	(3%)	0	(0%)	4	(2%)	\$19	(4%)
Non-confined	100	(2%)	0	(0%)	3	(2%)	\$19	(4%)
Confined	40	(1%)	0	(0%)	1	(0%)	\$0	(0%)

**Table 18.**  
**Structure Fires in Manufacturing Properties**  
**By Area of Origin, 2011-2015 Annual Averages (Continued)**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified area of origin	130	(3%)	0	(3%)	1	(1%)	\$16	(3%)
Non-confined	90	(2%)	0	(3%)	1	(1%)	\$16	(3%)
Confined	40	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified storage area	130	(3%)	1	(9%)	3	(1%)	\$75	(14%)
Non-confined	110	(2%)	1	(9%)	3	(1%)	\$75	(14%)
Confined	20	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified outside area	120	(2%)	0	(0%)	0	(2%)	\$5	(1%)
Non-confined	50	(1%)	0	(0%)	0	(2%)	\$5	(1%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Kitchen or cooking area	100	(2%)	0	(0%)	0	(0%)	\$1	(0%)
Non-confined	20	(0%)	0	(0%)	0	(0%)	\$1	(0%)
Confined	80	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Heating equipment room	80	(2%)	0	(0%)	4	(2%)	\$3	(1%)
Non-confined	50	(1%)	0	(0%)	4	(2%)	\$3	(1%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Conveyor	80	(21%)	2	(30%)	25	(14%)	\$106	(20%)
Non-confined	50	(17%)	2	(30%)	25	(14%)	\$106	(20%)
Confined	30	(4%)	0	(0%)	0	(0%)	\$0	(0%)
Confined chimney or flue fire	260	(5%)	0	(0%)	5	(3%)	\$1	(0%)
Non-confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Confined	260	(5%)	0	(100%)	5	(3%)	\$1	(0%)
<b>Total</b>	<b>5,080</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>176</b>	<b>(100%)</b>	<b>\$540</b>	<b>(100%)</b>
Non-confined	3,660	(72%)	6	(100%)	163	(93%)	\$536	(99%)
Confined	1,430	(28%)	0	(0%)	13	(7%)	\$4	(1%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires other than chimney or flue fires (NFIRS incident type 113, and 115-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 19.**  
**Structure Fires in Manufacturing Properties**  
**By Item First Ignited, 2011-2013 Annual Averages**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Dust, fiber, lint, including sawdust or excelsior	800	(16%)	1	(9%)	21	(12%)	\$66	(12%)
Non-confined	590	(12%)	1	(9%)	19	(11%)	\$65	(12%)
Confined	210	(4%)	0	(0%)	2	(1%)	\$1	(0%)
Flammable or combustible liquids or gases, piping or filter	760	(15%)	3	(48%)	63	(36%)	\$131	(24%)
Non-confined	570	(11%)	3	(48%)	63	(36%)	\$131	(24%)
Confined	190	(4%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified item first ignited	400	(8%)	1	(14%)	9	(5%)	\$24	(4%)
Non-confined	300	(6%)	1	(14%)	9	(5%)	\$24	(4%)
Confined	110	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Rubbish, trash, or waste	320	(6%)	0	(5%)	6	(3%)	\$2	(0%)
Non-confined	100	(2%)	0	(5%)	2	(1%)	\$2	(0%)
Confined	220	(4%)	0	(0%)	4	(2%)	\$0	(0%)
Electrical wire or cable insulation	300	(6%)	0	(0%)	11	(6%)	\$24	(4%)
Non-confined	2600	(5%)	0	(0%)	11	(6%)	\$24	(4%)
Confined	40	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Cooking materials, including food	230	(4%)	0	(0%)	3	(1%)	\$5	(1%)
Non-confined	50	(1%)	0	(0%)	1	(1%)	\$4	(1%)
Confined	170	(3%)	0	(0%)	1	(1%)	\$1	(0%)
Material being used to make a product	200	(4%)	0	(0%)	4	(2%)	\$24	(4%)
Non-confined	140	(3%)	0	(0%)	4	(2%)	\$24	(4%)
Confined	60	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Insulation within structural area	150	(3%)	0	(0%)	4	(2%)	\$6	(1%)
Non-confined	140	(3%)	0	(0%)	4	(2%)	\$6	(1%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified organic materials	150	(3%)	0	(0%)	0	(0%)	\$21	(4%)
Non-confined	100	(2%)	0	(0%)	0	(0%)	\$21	(4%)
Confined	50	(1%)	0	(0%)	0	(0%)	\$0	(0%)

**Table 19.**  
**Structure Fires in Manufacturing Properties**  
**By Item First Ignited, 2011-2015 Annual Averages (Continued)**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Structural member or framing	140	(3%)	0	(0%)	1	(0%)	\$10	(2%)
Non-confined	140	(3%)	0	(0%)	1	(0%)	\$10	(2%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Film or residue, including paint, resin, and creosote	130	(3%)	0	(0%)	10	(6%)	\$8	(1%)
Non-confined	80	(2%)	0	(0%)	3	(2%)	\$7	(1%)
Confined	50	(1%)	0	(0%)	6	(4%)	\$1	(0%)
Multiple items first ignited	120	(2%)	0	(4%)	4	(3%)	\$15	(3%)
Non-confined	90	(2%)	0	(4%)	4	(3%)	\$15	(3%)
Confined	30	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Box, carton, bag, basket, or barrel	110	(2%)	0	(0%)	1	(1%)	\$74	(14%)
Non-confined	80	(2%)	0	(0%)	1	(1%)	\$74	(14%)
Confined	40	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Exterior wall covering or finish	100	(2%)	0	(0%)	0	(0%)	\$11	(2%)
Non-confined	100	(2%)	0	(0%)	0	(0%)	\$11	(2%)
Confined	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Magazine, newspaper, or writing paper	100	(2%)	0	(0%)	1	(1%)	\$8	(1%)
Non-confined	60	(1%)	0	(0%)	1	(1%)	\$8	(1%)
Confined	40	(1%)	0	(0%)	0	(0%)	\$0	(0%)
Conveyor belt, drive belt, or V-belt	90	(2%)	0	(0%)	5	(3%)	\$9	(2%)
Non-confined	80	(2%)	0	(0%)	5	(3%)	\$9	(2%)
Confined	10	(0%)	0	(0%)	0	(0%)	\$0	(0%)
Other known item first ignited	960	(19%)	1	(20%)	35	(20%)	\$101	(19%)
Non-confined	760	(15%)	1	(20%)	35	(20%)	\$100	(19%)
Confined	200	(4%)	0	(0%)	0	(0%)	\$0	(0%)
<b>Total</b>	<b>5,080</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>176</b>	<b>(100%)</b>	<b>\$540</b>	<b>(100%)</b>
Non-confined	3,660	(72%)	6	(100%)	163	(93%)	\$536	(99%)
Confined	1,430	(28%)	0	(0%)	13	(7%)	\$4	(1%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident type 113-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 20.**  
**Structure Fires in Manufacturing Properties**  
**By Extent of Flame Spread, 2011-2015 Annual Averages**

Extent of Flame Spread	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	1,430	(28%)	0	(0%)	13	(7%)	\$4	(1%)
Confined to object of origin	1,170	(23%)	0	(6%)	48	(27%)	\$34	(6%)
Confined to room of origin	1,200	(24%)	1	(22%)	61	(35%)	\$61	(11%)
Confined to floor of origin	220	(4%)	0	(3%)	9	(5%)	\$19	(4%)
Confined to building of origin	920	(18%)	4	(65%)	39	(22%)	\$283	(52%)
Beyond building of origin	240	(3%)	0	(4%)	5	(3%)	\$139	(26%)
<b>Total</b>	<b>5,080</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>176</b>	<b>(100%)</b>	<b>\$540</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 21.**  
**Vehicle Fires in Industrial Properties**  
**By Month, 2011-2015 Annual Averages**

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	160	(6%)	0	(0%)	1	(13%)	\$7	(7%)
February	130	(5%)	1	(15%)	0	(4%)	\$7	(6%)
March	170	(6%)	1	(11%)	1	(8%)	\$4	(4%)
April	180	(7%)	0	(0%)	0	(3%)	\$24	(23%)
May	230	(9%)	1	(28%)	2	(17%)	\$7	(6%)
June	230	(9%)	0	(5%)	2	(17%)	\$7	(7%)
July	240	(9%)	0	(4%)	1	(10%)	\$9	(9%)
August	230	(9%)	0	(10%)	1	(9%)	\$7	(6%)
September	260	(10%)	0	(5%)	0	(3%)	\$10	(10%)
October	400	(15%)	0	(9%)	1	(11%)	\$11	(10%)
November	270	(10%)	0	(5%)	0	(0%)	\$9	(9%)
December	140	(6%)	0	(9%)	0	(5%)	\$4	(4%)
<b>Total</b>	<b>2,630</b>	<b>(100%)</b>	<b>5</b>	<b>(100%)</b>	<b>11</b>	<b>(100%)</b>	<b>\$107</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 22.**  
**Vehicle Fires in Industrial Properties**  
**By Day of Week, 2011-2015 Annual Averages**

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	290	(11%)	0	(9%)	0	(3%)	\$17	(16%)
Monday	400	(15%)	2	(35%)	2	(15%)	\$11	(11%)
Tuesday	410	(16%)	0	(5%)	2	(14%)	\$13	(12%)
Wednesday	400	(15%)	0	(9%)	2	(15%)	\$32	(30%)
Thursday	380	(14%)	0	(10%)	2	(17%)	\$11	(10%)
Friday	380	(14%)	1	(18%)	2	(21%)	\$12	(11%)
Saturday	370	(14%)	1	(14%)	2	(15%)	\$11	(10%)
<b>Total</b>	<b>2,630</b>	<b>(100%)</b>	<b>5</b>	<b>(100%)</b>	<b>11</b>	<b>(100%)</b>	<b>\$107</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.



**Table 23.**  
**Vehicle Fires in Industrial Properties**  
**By Time of Day, 2011-2015 Annual Averages**

Time of Day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Midnight-12:59 a.m.	50	(2%)	0	(0%)	0	(0%)	\$1	(1%)
1:00-1:59 a.m.	40	(2%)	0	(9%)	1	(6%)	\$2	(2%)
2:00-2:59 a.m.	40	(1%)	0	(5%)	0	(0%)	\$2	(1%)
3:00-3:59 a.m.	40	(1%)	0	(0%)	0	(0%)	\$2	(2%)
4:00-4:59 a.m.	40	(1%)	0	(4%)	1	(8%)	\$1	(1%)
5:00-5:59 a.m.	40	(2%)	0	(0%)	0	(4%)	\$3	(3%)
6:00-6:59 a.m.	50	(2%)	0	(5%)	0	(0%)	\$1	(1%)
7:00-7:59 a.m.	60	(2%)	0	(0%)	0	(0%)	\$2	(2%)
8:00-8:59 a.m.	80	(3%)	0	(5%)	0	(0%)	\$1	(1%)
9:00-9:59 a.m.	100	(4%)	0	(0%)	0	(4%)	\$3	(3%)
10:00-10:59 a.m.	140	(5%)	0	(5%)	0	(0%)	\$4	(4%)
11:00-11:59 a.m.	150	(6%)	0	(0%)	1	(11%)	\$4	(4%)
12:00-12:59 p.m.	170	(7%)	0	(5%)	1	(7%)	\$23	(22%)
1:00-1:59 p.m.	210	(8%)	0	(0%)	1	(6%)	\$8	(8%)
2:00-2:59 p.m.	240	(9%)	1	(13%)	1	(8%)	\$8	(7%)
3:00-3:59 p.m.	240	(9%)	1	(11%)	2	(17%)	\$7	(7%)
4:00-4:59 p.m.	220	(8%)	0	(6%)	0	(4%)	\$10	(9%)
5:00-5:59 p.m.	190	(7%)	0	(0%)	1	(14%)	\$8	(8%)
6:00-6:59 p.m.	160	(6%)	0	(10%)	0	(0%)	\$5	(5%)
7:00-7:59 p.m.	110	(4%)	1	(14%)	1	(7%)	\$4	(4%)
8:00-8:59 p.m.	90	(4%)	0	(5%)	0	(0%)	\$2	(2%)
9:00-9:59 p.m.	70	(3%)	0	(0%)	0	(4%)	\$2	(1%)
10:00-10:59 p.m.	60	(2%)	0	(0%)	0	(0%)	\$1	(1%)
11:00-11:59 p.m.	50	(2%)	0	(5%)	0	(0%)	\$1	(1%)
<b>Total</b>	<b>2,630</b>	<b>(100%)</b>	<b>5</b>	<b>(100%)</b>	<b>11</b>	<b>(100%)</b>	<b>\$107</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 24.**  
**Vehicle Fires in Industrial Properties**  
**By Incident Type, 2011-2015 Annual Averages**

Incident Type	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Off-road vehicle or heavy equipment fire	1,420	(54%)	0	(6%)	3	(30%)	\$59	(55%)
Passenger vehicle fire	630	(24%)	2	(46%)	4	(36%)	\$6	(5%)
Unclassified mobile property (vehicle) fire	290	(11%)	0	(5%)	1	(14%)	\$9	(8%)
Road, freight, or transport vehicle fire	240	(9%)	0	(4%)	1	(8%)	\$12	(11%)
Other known vehicle fire incident type	50	(2%)	2	(39%)	1	(12%)	\$21	(20%)
<b>Total</b>	<b>2,630</b>	<b>(100%)</b>	<b>5</b>	<b>(100%)</b>	<b>11</b>	<b>(100%)</b>	<b>\$107</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 25.**  
**Vehicle Fires in Industrial Properties**  
**By Factor Contributing to Ignition, 2011-2015 Annual Averages**

Factor Contributing to Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Mechanical failure or malfunction	1,210	(46%)	1	(12%)	5	(44%)	\$57	(53%)
Electrical failure or malfunction	400	(15%)	1	(32%)	1	(7%)	\$16	(15%)
Unclassified factor contributed to ignition	210	(8%)	1	(12%)	1	(6%)	\$6	(5%)
Heat source too close to combustibles	160	(6%)	1	(12%)	1	(13%)	\$6	(5%)
Failure to clean	130	(5%)	0	(0%)	0	(0%)	\$4	(4%)
Exposure fire	120	(4%)	0	(0%)	0	(0%)	\$7	(7%)
Unclassified natural condition	50	(2%)	0	(0%)	0	(0%)	\$1	(1%)
Flammable liquid or gas spilled	50	(2%)	1	(12%)	1	(6%)	\$2	(2%)
Cutting or welding too close to combustibles	40	(2%)	1	(14%)	1	(12%)	\$1	(1%)
Other known factor contributing to ignition	370	(14%)	1	(21%)	0	(17%)	\$13	(12%)
<b>Total fires</b>	<b>2,630</b>	<b>(100%)</b>	<b>5</b>	<b>(100%)</b>	<b>11</b>	<b>(100%)</b>	<b>\$107</b>	<b>(100%)</b>
<b>Total factors</b>	<b>2,730</b>	<b>(104%)</b>	<b>5</b>	<b>(113%)</b>	<b>11</b>	<b>(106%)</b>	<b>\$113</b>	<b>(106%)</b>

Note: Multiple entries are allowed which can result in sums higher than totals. Fires in which the factor contributing to ignition was coded as “none,” “unknown”, or “not reported” have been allocated proportionally among fires with known factor contributing to ignition. Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars. See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 26.**  
**Vehicle Fires in Industrial Properties**  
**By Heat Source, 2011-2015 Annual Averages**

Heat Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified heat from powered equipment	670	(25%)	1	(20%)	4	(38%)	\$31	(29%)
Radiated or conducted heat from operating equipment	540	(20%)	1	(19%)	0	(4%)	\$23	(22%)
Spark, ember or flame from operating equipment	300	(12%)	1	(12%)	1	(9%)	\$14	(13%)
Arcing	280	(11%)	1	(29%)	0	(4%)	\$9	(8%)
Heat or spark from friction	190	(7%)	0	(10%)	1	(12%)	\$5	(5%)
Unclassified hot or smoldering object	160	(6%)	0	(0%)	1	(6%)	\$4	(4%)
Unclassified heat source	140	(5%)	0	(10%)	0	(4%)	\$5	(5%)
Heat from direct flame or convection currents	50	(2%)	0	(0%)	1	(6%)	\$4	(4%)
Hot ember or ash	40	(2%)	0	(0%)	0	(5%)	\$1	(1%)
Other known heat source	270	(10%)	0	(0%)	1	(13%)	\$10	(10%)
<b>Total</b>	<b>2,630</b>	<b>(100%)</b>	<b>5</b>	<b>(100%)</b>	<b>11</b>	<b>(100%)</b>	<b>\$107</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 27.**  
**Vehicle Fires in Industrial Properties**  
**By Area of Origin, 2011-2015 Annual Averages**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Engine area, running gear, or wheel area of vehicle	1,350	(51%)	2	(41%)	4	(35%)	\$59	(55%)
Unclassified vehicle area	320	(12%)	1	(28%)	1	(12%)	\$10	(9%)
Passenger area of vehicle	190	(7%)	1	(26%)	1	(8%)	\$5	(4%)
Lawn, field, or open area	160	(6%)	0	(5%)	0	(0%)	\$7	(6%)
Exterior surface of vehicle	130	(5%)	0	(0%)	0	(0%)	\$6	(6%)
Cargo or trunk area of vehicle	90	(3%)	0	(0%)	1	(11%)	\$5	(5%)
Unclassified area of origin	90	(3%)	0	(0%)	1	(9%)	\$5	(5%)
Unclassified outside area	60	(2%)	0	(0%)	1	(7%)	\$1	(1%)
Fuel tank or fuel line of vehicle	60	(2%)	0	(0%)	1	(6%)	\$2	(2%)
Unclassified equipment or service area	50	(2%)	0	(0%)	0	(0%)	\$2	(1%)
Other known area of origin	140	(5%)	0	(0%)	1	(12%)	\$5	(4%)
<b>Total</b>	<b>2,630</b>	<b>(100%)</b>	<b>5</b>	<b>(100%)</b>	<b>11</b>	<b>(100%)</b>	<b>\$107</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 28.**  
**Vehicle Fires in Industrial Properties**  
**By Item First Ignited, 2011-2015 Annual Averages**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Flammable or combustible liquids or gases, piping or filter	560	(21%)	4	(89%)	5	(52%)	\$42	(40%)
Agricultural crop, including fruits and vegetables	540	(20%)	0	(0%)	1	(5%)	\$19	(18%)
Electrical wire or cable insulation	420	(16%)	0	(0%)	0	(0%)	\$14	(13%)
Unclassified item first ignited	290	(11%)	0	(0%)	0	(4%)	\$11	(10%)
Light vegetation including grass	190	(7%)	0	(0%)	0	(4%)	\$4	(4%)
Unclassified organic materials	110	(4%)	0	(0%)	0	(0%)	\$2	(1%)
Multiple items first ignited	100	(4%)	1	(11%)	0	(0%)	\$4	(3%)
Tire	90	(3%)	0	(0%)	0	(0%)	\$2	(2%)
Dust, fiber, lint, including sawdust or excelsior	70	(3%)	0	(0%)	1	(5%)	\$3	(3%)
Conveyor belt, drive belt, or V-belt	60	(2%)	0	(0%)	1	(13%)	\$2	(1%)
Rubbish, trash, or waste	50	(2%)	0	(0%)	0	(0%)	\$1	(1%)
Upholstered furniture or vehicle seat	50	(2%)	0	(0%)	1	(12%)	\$1	(1%)
Other known item first ignited	110	(4%)	0	(0%)	0	(5%)	\$2	(2%)
<b>Total</b>	<b>2,630</b>	<b>(100%)</b>	<b>5</b>	<b>(100%)</b>	<b>11</b>	<b>(100%)</b>	<b>\$107</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 29.**  
**Vehicle Fires in Industrial Properties**  
**By Cause of Ignition, 2011-2015 Annual Averages**

Cause of Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unintentional	1,360	(52%)	3	(67%)	7	(63%)	\$48	(45%)
Failure of equipment or heat source	920	(35%)	0	(0%)	3	(33%)	\$44	(41%)
Intentional	250	(9%)	2	(33%)	0	(4%)	\$9	(9%)
Unclassified cause	80	(3%)	0	(0%)	0	(0%)	\$5	(4%)
Other known cause	20	(1%)	0	(0%)	0	(0%)	\$0	(0%)
<b>Total</b>	<b>2,630</b>	<b>(100%)</b>	<b>5</b>	<b>(100%)</b>	<b>11</b>	<b>(100%)</b>	<b>\$107</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Confined structure fires other than chimney or flue fires (NFIRS incident type 113, and 115-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 30.**  
**Vehicle Fires in Manufacturing Properties, by Month**  
**2011-2015 Annual Averages**

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	70	(9%)	0	(50%)	0	(0%)	\$1	(7%)
February	60	(8%)	0	(0%)	0	(5%)	\$1	(5%)
March	70	(9%)	0	(0%)	0	(8%)	\$3	(18%)
April	70	(8%)	0	(0%)	1	(24%)	\$1	(6%)
May	60	(8%)	0	(0%)	0	(0%)	\$2	(8%)
June	70	(9%)	0	(26%)	0	(5%)	\$1	(8%)
July	70	(9%)	0	(0%)	1	(20%)	\$2	(9%)
August	70	(9%)	0	(0%)	1	(22%)	\$2	(9%)
September	70	(9%)	0	(24%)	0	(8%)	\$2	(10%)
October	50	(7%)	0	(0%)	0	(8%)	\$2	(9%)
November	60	(8%)	0	(0%)	0	(0%)	\$1	(4%)
December	60	(7%)	0	(0%)	0	(0%)	\$1	(6%)
<b>Total</b>	<b>780</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>\$19</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.



**Table 31.**  
**Vehicle Fires in Manufacturing Properties, by Day of Week**  
**2011-2015 Annual Averages**

Day of Week	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	60	(8%)	0	(0%)	0	(6%)	\$4	(21%)
Monday	130	(17%)	0	(26%)	1	(16%)	\$2	(12%)
Tuesday	120	(16%)	0	(0%)	0	(5%)	\$3	(14%)
Wednesday	130	(16%)	0	(24%)	1	(13%)	\$2	(10%)
Thursday	130	(17%)	0	(24%)	2	(31%)	\$3	(17%)
Friday	130	(16%)	0	(0%)	1	(21%)	\$3	(16%)
Saturday	80	(10%)	0	(26%)	0	(8%)	\$2	(11%)
<b>Total</b>	<b>780</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>\$19</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 32.**  
**Vehicle Fires in Manufacturing Properties, by Time of Day**  
**2011-2015 Annual Averages**

Time of Day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight-12:59 a.m.	20	2%	0	(0%)	0	(0%)	\$1	(3%)
1:00-1:59 a.m.	20	2%	0	(0%)	0	(0%)	\$0	(2%)
2:00-2:59 a.m.	20	2%	0	(0%)	0	(8%)	\$1	(3%)
3:00-3:59 a.m.	20	2%	0	(0%)	0	(0%)	\$1	(3%)
4:00-4:59 a.m.	20	2%	0	(24%)	0	(0%)	\$0	(2%)
5:00-5:59 a.m.	30	3%	0	(0%)	0	(0%)	\$1	(3%)
6:00-6:59 a.m.	30	4%	0	(0%)	0	(0%)	\$0	(3%)
7:00-7:59 a.m.	30	4%	0	(0%)	0	(8%)	\$0	(2%)
8:00-8:59 a.m.	40	5%	0	(0%)	0	(8%)	\$0	(1%)
9:00-9:59 a.m.	40	5%	0	(0%)	1	(10%)	\$3	(17%)
10:00-10:59 a.m.	40	6%	0	(0%)	0	(0%)	\$1	(7%)
11:00-11:59 a.m.	50	6%	0	(26%)	1	(16%)	\$1	(5%)
12:00-12:59 p.m.	40	6%	0	(26%)	2	(27%)	\$2	(8%)
1:00-1:59 p.m.	50	6%	0	(0%)	1	(10%)	\$1	(5%)
2:00-2:59 p.m.	50	7%	0	(0%)	0	(0%)	\$1	(6%)
3:00-3:59 p.m.	60	7%	0	(0%)	0	(8%)	\$1	(5%)
4:00-4:59 p.m.	40	5%	0	(0%)	0	(0%)	\$0	(2%)
5:00-5:59 p.m.	40	5%	0	(0%)	0	(0%)	\$1	(5%)
6:00-6:59 p.m.	30	4%	0	(0%)	0	(5%)	\$1	(4%)
7:00-7:59 p.m.	30	4%	0	(0%)	0	(0%)	\$0	(2%)
8:00-8:59 p.m.	30	4%	0	(0%)	0	(0%)	\$1	(5%)
9:00-9:59 p.m.	20	3%	0	(0%)	0	(0%)	\$0	(2%)
10:00-10:59 p.m.	20	3%	0	(0%)	0	(0%)	\$0	(2%)
11:00-11:59 p.m.	20	3%	0	(24%)	0	(0%)	\$1	(3%)
<b>Total</b>	<b>780</b>	<b>100%</b>	<b>1</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>\$19</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 33.**  
**Vehicle Fires in Manufacturing Properties, by Incident Type**  
**2011-2015 Annual Averages**

Incident Type	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Passenger vehicle fire	300	(38%)	0	(26%)	1	(16%)	\$1	(7%)
Road freight or transport vehicle fire	210	(27%)	0	(24%)	0	(8%)	\$5	(26%)
Off-road vehicle or heavy equipment fire	140	(18%)	0	(24%)	2	(36%)	\$8	(44%)
Unclassified mobile property (vehicle) fire	110	(14%)	0	(0%)	1	(25%)	\$1	(7%)
Other known vehicle	30	(3%)	0	(26%)	1	(16%)	\$3	(17%)
<b>Total</b>	<b>780</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>\$19</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 34.**  
**Vehicle Fires in Manufacturing Properties**  
**By Factor Contributing to Ignition, 2011-2015 Annual Averages**

Factor Contributing to Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Mechanical failure or malfunction	290	(37%)	0	(0%)	2	(32%)	\$6	(32%)
Electrical failure or malfunction	170	(22%)	0	(0%)	0	(0%)	\$4	(23%)
Exposure fire	90	(11%)	0	(0%)	0	(0%)	\$1	(8%)
Unclassified factor contributed to ignition	50	(6%)	0	(0%)	0	(0%)	\$2	(12%)
Heat source too close to combustibles	40	(5%)	0	(0%)	1	(22%)	\$1	(6%)
Cutting or welding too close to combustibles	30	(4%)	0	(0%)	0	(0%)	\$0	(1%)
Failure to clean	20	(3%)	0	(0%)	0	(0%)	\$1	(3%)
Unclassified misuse of material or product	20	(3%)	0	(0%)	0	(0%)	\$1	(4%)
Abandoned or discarded material or product	10	(2%)	0	(0%)	0	(0%)	\$0	(2%)
Other known factor contributing to ignition	80	(10%)	1	(100%)	0	(67%)	\$2	(11%)
<b>Total fires</b>	<b>780</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>\$19</b>	<b>(100%)</b>
<b>Total factors</b>	<b>800</b>	<b>(103%)</b>	<b>1</b>	<b>(100%)</b>	<b>10</b>	<b>(122%)</b>	<b>\$19</b>	<b>(102%)</b>

Note: Multiple entries are allowed which can result in sums higher than totals. Fires in which the factor contributing to ignition was coded as “none,” “unknown,” or “not reported” have been allocated proportionally among fires with known factor contributing to ignition. Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars. See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 35.**  
**Vehicle Fires in Manufacturing Properties**  
**By Heat Source, 2011-2015 Annual Averages**

Heat Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified heat from powered equipment	180	(23%)	0	(0%)	1	(24%)	\$4	(23%)
Arcing	130	(17%)	0	(32%)	1	(24%)	\$2	(11%)
Radiated or conducted heat from operating equipment	110	(13%)	0	(0%)	2	(32%)	\$1	(6%)
Spark, ember or flame from operating equipment	60	(8%)	0	(0%)	0	(0%)	\$6	(30%)
Unclassified hot or smoldering object	60	(7%)	0	(0%)	0	(0%)	\$1	(6%)
Unclassified heat source	50	(6%)	0	(68%)	0	(0%)	\$1	(7%)
Radiated heat from another fire	30	(4%)	0	(0%)	0	(0%)	\$0	(2%)
Molten or hot material	30	(4%)	0	(0%)	1	(20%)	\$1	(7%)
Heat or spark from friction	20	(3%)	0	(0%)	0	(0%)	\$0	(2%)
Heat from direct flame or convection currents	20	(3%)	0	(0%)	0	(0%)	\$0	(2%)
Flame or torch used for lighting	20	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Hot ember or ash	20	(2%)	0	(0%)	0	(0%)	\$0	(1%)
Spontaneous combustion or chemical reaction	10	(2%)	0	(0%)	0	(0%)	\$0	(2%)
Other known heat source	40	(6%)	0	(0%)	0	(0%)	\$1	(3%)
<b>Total</b>	<b>780</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>\$19</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 36.**  
**Vehicle Fires in Manufacturing Properties**  
**By Area of Origin, 2011-2015 Annual Averages**

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Engine area, running gear, or wheel area of vehicle	380	(49%)	0	(32%)	1	(17%)	\$8	(42%)
Passenger area of vehicle	80	(10%)	0	(0%)	1	(9%)	\$1	(6%)
Cargo or trunk area of vehicle	70	(9%)	0	(0%)	2	(26%)	\$1	(6%)
Unclassified vehicle area	70	(8%)	0	(0%)	1	(9%)	\$1	(8%)
Exterior surface of vehicle	50	(7%)	0	(0%)	1	(8%)	\$1	(7%)
Unclassified outside area	20	(2%)	0	(34%)	0	(0%)	\$0	(2%)
Unclassified area of origin	20	(2%)	0	(0%)	0	(0%)	\$1	(3%)
Shipping receiving or loading area	10	(2%)	0	(0%)	0	(0%)	\$0	(1%)
Fuel tank or fuel line of vehicle	10	(2%)	0	(0%)	1	(15%)	\$0	(1%)
Other known area of origin	70	(9%)	0	(34%)	1	(17%)	\$4	(23%)
<b>Total</b>	<b>780</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>\$19</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 37.**  
**Vehicle Fires in Manufacturing Properties**  
**By Item First Ignited, 2011-2015 Annual Averages**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Electrical wire or cable insulation	210	(26%)	0	(0%)	1	(14%)	\$2	(11%)
Flammable or combustible liquids or gases, piping or filter	140	(18%)	1	(100%)	3	(50%)	\$9	(48%)
Unclassified item first ignited	130	(16%)	0	(0%)	0	(0%)	\$2	(10%)
Multiple items first ignited	40	(5%)	0	(0%)	1	(10%)	\$0	(2%)
Tire	40	(5%)	0	(0%)	0	(0%)	\$1	(7%)
Dust, fiber, lint, including sawdust or excelsior	40	(5%)	0	(0%)	0	(0%)	\$1	(5%)
Rubbish, trash, or waste	30	(3%)	0	(0%)	0	(0%)	\$0	(1%)
Upholstered furniture or vehicle seat	30	(3%)	0	(0%)	0	(0%)	\$0	(0%)
Unclassified organic materials	20	(2%)	0	(0%)	0	(0%)	\$0	(1%)
Other known item first ignited	130	(16%)	0	(0%)	2	(27%)	\$3	(14%)
<b>Total</b>	<b>780</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>\$19</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 38.**  
**Vehicle Fires in Manufacturing Facilities**  
**By Cause of Ignition, 2011-2015 Annual Averages**

Cause of Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Unintentional	460	(59%)	1	(100%)	5	(80%)	\$13	(69%)
Failure of equipment or heat source	240	(30%)	0	(0%)	1	(20%)	\$5	(25%)
Unclassified cause	60	(7%)	0	(0%)	0	(0%)	\$1	(4%)
Intentional	30	(3%)	0	(0%)	0	(0%)	\$0	(2%)
Other known cause	0	(0%)	0	(0%)	0	(0%)	\$0	(0%)
<b>Total</b>	<b>780</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>6</b>	<b>(100%)</b>	<b>\$19</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Confined structure fires other than chimney or flue fires (NFIRS incident type 113, and 115-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See [Appendix A](#) for details.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.



**Table 39.**  
**Outside Trash and Rubbish Fires in Industrial and Manufacturing Properties**  
**By Property Use, 2011-2015 Annual Averages**

Property Use	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
	Count	(%)	Count	(%)	Count	(%)
Industrial, utility, defense, agriculture, mining	1,940	(55%)	0	(64%)	\$2	(49%)
Unclassified utility, defense, agriculture, mining	320	(9%)	0	(0%)	\$0	(8%)
Energy production plant	30	(1%)	0	(0%)	\$1	(17%)
Laboratory	30	(1%)	0	(0%)	\$0	(0%)
Defense, computer or communications center	30	(1%)	0	(0%)	\$0	(0%)
Utility or distribution system	340	(10%)	0	(0%)	\$0	(13%)
Agriculture	570	(16%)	0	(0%)	\$0	(9%)
Forest, timberland or woodland	580	(16%)	0	(64%)	\$0	(2%)
Mine or quarry	40	(1%)	0	(0%)	\$0	(0%)
Manufacturing or processing	1,580	(45%)	0	(36%)	\$2	(51%)
<b>Totals</b>	<b>3,520</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>\$3</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 40.**  
**Non-Trash Outside and Unclassified Fires in Industrial and Manufacturing Properties**  
**By Property Use, 2011-2015 Annual Averages**

Property Use	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Industrial, utility, defense, agriculture, mining	20,710	(89%)	2	(81%)	19	(51%)	\$170	(65%)
Unclassified utility, defense, agriculture, mining	1,650	(7%)	0	(5%)	1	(3%)	\$9	(4%)
Energy production plant	240	(1%)	0	(0%)	0	(1%)	\$70	(27%)
Laboratory	50	(0%)	0	(0%)	1	(2%)	\$1	(0%)
Defense, computer or communications center	250	(1%)	0	(0%)	0	(0%)	\$1	(0%)
Utility or distribution system	1,850	(8%)	0	(13%)	6	(16%)	\$47	(18%)
Agriculture	5,690	(25%)	0	(15%)	3	(7%)	\$23	(9%)
Forest, timberland or woodland	10,830	(47%)	1	(49%)	8	(21%)	\$18	(7%)
Mine or quarry	150	(1%)	0	(0%)	1	(2%)	\$1	(0%)
Manufacturing or processing	2,500	(11%)	1	(19%)	18	(49%)	\$93	(35%)
<b>Total</b>	<b>23,210</b>	<b>(100%)</b>	<b>3</b>	<b>(100%)</b>	<b>37</b>	<b>(100%)</b>	<b>\$262</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 41.**  
**Outside Trash and Rubbish Fires in Industrial Properties**  
**By Month, 2011-2015 Annual Averages**

Month	Fires		Direct Property Damage (in Millions)	
January	150	(8%)	\$0	(0%)
February	140	(7%)	\$1	(33%)
March	190	(10%)	\$0	(0%)
April	200	(10%)	\$0	(5%)
May	200	(10%)	\$0	(7%)
June	170	(9%)	\$0	(1%)
July	180	(9%)	\$0	(15%)
August	160	(8%)	\$0	(10%)
September	150	(8%)	\$0	(21%)
October	150	(8%)	\$0	(5%)
November	150	(8%)	\$0	(1%)
December	110	(6%)	\$0	(1%)
<b>Total</b>	<b>1,940</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 42.**  
**Non-Trash and Unclassified Fires in Industrial Properties**  
**By Month, 2011-2015 Annual Averages**

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	1,240	(6%)	0	(6%)	1	(5%)	\$3	(2%)
February	1,400	(7%)	0	(12%)	2	(11%)	\$2	(1%)
March	2,540	(12%)	0	(8%)	1	(5%)	\$26	(16%)
April	2,690	(13%)	0	(14%)	3	(14%)	\$12	(7%)
May	1,880	(9%)	0	(10%)	4	(20%)	\$5	(3%)
June	1,880	(9%)	0	(0%)	1	(8%)	\$12	(7%)
July	2,120	(10%)	0	(0%)	1	(7%)	\$24	(14%)
August	1,760	(8%)	1	(24%)	2	(9%)	\$8	(5%)
September	1,420	(7%)	0	(14%)	1	(4%)	\$9	(6%)
October	1,610	(8%)	0	(0%)	1	(6%)	\$12	(7%)
November	1,470	(7%)	0	(12%)	2	(8%)	\$51	(30%)
December	700	(3%)	0	(0%)	1	(3%)	\$3	(2%)
<b>Total</b>	<b>20,710</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>19</b>	<b>(100%)</b>	<b>\$170</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 43.**  
**Outside Trash and Rubbish Fires in Manufacturing Properties**  
**By Month, 2011-2015 Annual Averages**

Month	Fires		Direct Property Damage (in Millions)	
January	100	(6%)	\$0	(4%)
February	100	(7%)	\$0	(1%)
March	140	(9%)	\$0	(4%)
April	150	(10%)	\$0	(25%)
May	150	(10%)	\$0	(3%)
June	170	(11%)	\$0	(28%)
July	160	(10%)	\$0	(3%)
August	150	(9%)	\$0	(8%)
September	130	(8%)	\$0	(7%)
October	120	(8%)	\$0	(11%)
November	110	(7%)	\$0	(3%)
December	90	(6%)	\$0	(2%)
<b>Total</b>	<b>1,580</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 44.**  
**Non-Trash Outside and Unclassified Fires in Manufacturing Properties**  
**By Month, 2011-1015 Annual Averages**

Month	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
January	200	(8%)	0	(0%)	1	(6%)	\$5	(6%)
February	170	(7%)	0	(0%)	1	(3%)	\$4	(4%)
March	210	(9%)	0	(0%)	3	(16%)	\$3	(3%)
April	230	(9%)	0	(26%)	1	(7%)	\$3	(3%)
May	230	(9%)	0	(0%)	2	(10%)	\$52	(56%)
June	240	(9%)	0	(0%)	2	(9%)	\$6	(6%)
July	250	(10%)	0	(0%)	2	(10%)	\$2	(2%)
August	230	(9%)	0	(74%)	1	(4%)	\$4	(4%)
September	210	(8%)	0	(0%)	1	(3%)	\$2	(2%)
October	190	(8%)	0	(0%)	4	(19%)	\$4	(4%)
November	180	(7%)	0	(0%)	1	(6%)	\$3	(3%)
December	160	(6%)	0	(0%)	1	(7%)	\$5	(5%)
<b>Total</b>	<b>2,500</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>18</b>	<b>(100%)</b>	<b>\$93</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 45.**  
**Outside Trash and Rubbish Fires in Industrial Properties**  
**By Day, 2011-2015 Annual Averages**

<b>Day of Week</b>	<b>Fires</b>		<b>Direct Property Damage (in Millions)</b>	
Sunday	270	(14%)	\$0	(6%)
Monday	280	(15%)	\$0	(17%)
Tuesday	270	(14%)	\$1	(39%)
Wednesday	260	(13%)	\$0	(13%)
Thursday	270	(14%)	\$0	(2%)
Friday	290	(15%)	\$0	(20%)
Saturday	300	(16%)	\$0	(3%)
<b>Total</b>	<b>1,940</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 45A.**  
**Non-Trash Outside and Unclassified Fires in Industrial Properties**  
**By Day, 2011-2015 Annual Averages**

<b>Day of Week</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Sunday	3,080	(15%)	1	(34%)	2	(12%)	\$5	(3%)
Monday	2,980	(14%)	0	(18%)	3	(14%)	\$20	(12%)
Tuesday	2,810	(14%)	0	(6%)	3	(15%)	\$9	(5%)
Wednesday	2,850	(14%)	0	(0%)	3	(14%)	\$36	(21%)
Thursday	2,760	(13%)	0	(8%)	3	(18%)	\$56	(33%)
Friday	2,790	(13%)	0	(7%)	3	(15%)	\$30	(18%)
Saturday	3,440	(17%)	1	(27%)	2	(12%)	\$13	(7%)
<b>Total</b>	<b>20,710</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>19</b>	<b>(100%)</b>	<b>\$170</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 46.**  
**Outside Trash and Rubbish Fires in Manufacturing Properties**  
**By Day of Week, 2011-2015 Annual Averages**

<b>Day of Week</b>	<b>Fires</b>		<b>Direct Property Damage (in Millions)</b>	
Sunday	160	(10%)	\$0	(2%)
Monday	220	(14%)	\$0	(24%)
Tuesday	240	(15%)	\$0	(22%)
Wednesday	230	(15%)	\$0	(10%)
Thursday	250	(16%)	\$0	(12%)
Friday	270	(17%)	\$0	(12%)
Saturday	190	(12%)	\$0	(18%)
<b>Total</b>	<b>1,580</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 46A.**  
**Non-Trash Outside and Unclassified Fires in Manufacturing Properties**  
**By Day of Week, 2011-2015 Annual Averages**

<b>Day of Week</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Sunday	250	(10%)	0	(0%)	2	(9%)	\$3	(4%)
Monday	390	(16%)	0	(0%)	1	(8%)	\$25	(27%)
Tuesday	390	(16%)	0	(31%)	2	(14%)	\$32	(34%)
Wednesday	410	(16%)	0	(0%)	2	(10%)	\$4	(4%)
Thursday	400	(16%)	0	(0%)	4	(24%)	\$8	(8%)
Friday	370	(15%)	0	(26%)	4	(23%)	\$14	(15%)
Saturday	290	(12%)	0	(43%)	2	(12%)	\$7	(7%)
<b>Total</b>	<b>2,500</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>18</b>	<b>(100%)</b>	<b>\$93</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.



**Table 47.**  
**Outside Trash and Rubbish Fires in Industrial Properties**  
**By Time of Day, 2011-2015 Annual Averages**

Alarm Hour	Fires		Direct Property Damage (in Millions)	
Midnight-12:59 a.m.	40	(2%)	\$0	(6%)
1:00-1:59 a.m.	30	(2%)	\$0	(0%)
2:00-2:59 a.m.	20	(1%)	\$0	(13%)
3:00-3:59 a.m.	20	(1%)	\$0	(0%)
4:00-4:59 a.m.	30	(1%)	\$0	(0%)
5:00-5:59 a.m.	20	(1%)	\$0	(2%)
6:00-6:59 a.m.	40	(2%)	\$0	(1%)
7:00-7:59 a.m.	50	(3%)	\$0	(0%)
8:00-8:59 a.m.	50	(3%)	\$0	(0%)
9:00-9:59 a.m.	60	(3%)	\$0	(0%)
10:00-10:59 a.m.	90	(5%)	\$0	(2%)
11:00-11:59 a.m.	90	(5%)	\$0	(2%)
12:00-12:59 p.m.	110	(6%)	\$0	(7%)
1:00-1:59 p.m.	130	(7%)	\$0	(1%)
2:00-2:59 p.m.	140	(7%)	\$0	(10%)
3:00-3:59 p.m.	140	(7%)	\$0	(3%)
4:00-4:59 p.m.	140	(7%)	\$0	(1%)
5:00-5:59 p.m.	150	(8%)	\$0	(14%)
6:00-6:59 p.m.	130	(7%)	\$0	(0%)
7:00-7:59 p.m.	130	(6%)	\$0	(0%)
8:00-8:59 p.m.	110	(6%)	\$0	(1%)
9:00-9:59 p.m.	100	(5%)	\$0	(0%)
10:00-10:59 p.m.	70	(4%)	\$1	(34%)
11:00-11:59 p.m.	50	(3%)	\$0	(1%)
<b>Total</b>	<b>1,940</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 47A.**  
**Non-Trash Outside and Unclassified Fires in Industrial Properties**  
**By Time of Day, 2011-2015 Annual Averages**

<b>Time of Day</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Midnight- 12:59 a.m.	300	(1%)	0	(7%)	0	(1%)	\$2	(1%)
1:00-1:59 a.m.	200	(1%)	0	(0%)	0	(1%)	\$1	(1%)
2:00-2:59 a.m.	190	(1%)	0	(0%)	0	(0%)	\$4	(2%)
3:00-3:59 a.m.	170	(1%)	0	(0%)	0	(0%)	\$1	(1%)
4:00-4:59 a.m.	160	(1%)	0	(0%)	0	(2%)	\$1	(0%)
5:00-5:59 a.m.	220	(1%)	0	(6%)	0	(0%)	\$2	(1%)
6:00-6:59 a.m.	310	(2%)	0	(0%)	0	(1%)	\$1	(0%)
7:00-7:59 a.m.	350	(2%)	0	(0%)	0	(0%)	\$48	(29%)
8:00-8:59 a.m.	400	(2%)	0	(0%)	0	(2%)	\$2	(1%)
9:00-9:59 a.m.	460	(2%)	0	(6%)	1	(4%)	\$1	(0%)
10:00-10:59 a.m.	670	(3%)	0	(0%)	2	(11%)	\$9	(6%)
11:00-11:59 a.m.	1,010	(5%)	0	(0%)	2	(10%)	\$5	(3%)
12:00-12:59 p.m.	1,430	(7%)	1	(24%)	2	(10%)	\$8	(5%)
1:00-1:59 p.m.	1,880	(9%)	0	(7%)	3	(15%)	\$7	(4%)
2:00-2:59 p.m.	2,230	(11%)	1	(32%)	2	(11%)	\$4	(3%)
3:00-3:59 p.m.	2,200	(11%)	0	(0%)	2	(9%)	\$12	(7%)
4:00-4:59 p.m.	2,040	(10%)	0	(6%)	3	(13%)	\$6	(3%)
5:00-5:59 p.m.	1,700	(8%)	0	(6%)	0	(0%)	\$3	(2%)
6:00-6:59 p.m.	1,360	(7%)	0	(0%)	0	(2%)	\$9	(5%)
7:00-7:59 p.m.	1,060	(5%)	0	(6%)	0	(1%)	\$3	(1%)
8:00-8:59 p.m.	890	(4%)	0	(0%)	1	(3%)	\$2	(1%)
9:00-9:59 p.m.	680	(3%)	0	(0%)	0	(0%)	\$3	(2%)
10:00-10:59 p.m.	470	(2%)	0	(0%)	0	(1%)	\$10	(6%)
11:00-11:59 p.m.	320	(2%)	0	(0%)	0	(1%)	\$27	(16%)
<b>Total</b>	<b>20,710</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>19</b>	<b>(100%)</b>	<b>\$170</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 48.**  
**Outside Trash and Rubbish Fires in Manufacturing Properties**  
**By Time of Day, 2011-2015 Annual Averages**

<b>Time of Day</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Midnight-12:59 a.m.	40	(3%)	0	(0%)	0	(0%)	\$0	(13%)
1:00-1:59 a.m.	40	(2%)	0	(0%)	0	(0%)	\$0	(0%)
2:00-2:59 a.m.	30	(2%)	0	(0%)	0	(0%)	\$0	(1%)
3:00-3:59 a.m.	30	(2%)	0	(0%)	0	(0%)	\$0	(0%)
4:00-4:59 a.m.	30	(2%)	0	(0%)	0	(0%)	\$0	(5%)
5:00-5:59 a.m.	50	(3%)	0	(0%)	0	(0%)	\$0	(0%)
6:00-6:59 a.m.	40	(3%)	0	(0%)	0	(0%)	\$0	(1%)
7:00-7:59 a.m.	50	(3%)	0	(0%)	0	(0%)	\$0	(1%)
8:00-8:59 a.m.	60	(4%)	0	(0%)	0	(0%)	\$0	(1%)
9:00-9:59 a.m.	70	(4%)	0	(0%)	0	(0%)	\$0	(0%)
10:00-10:59 a.m.	70	(5%)	0	(0%)	0	(100%)	\$0	(17%)
11:00-11:59 a.m.	70	(5%)	0	(0%)	0	(0%)	\$0	(7%)
12:00-12:59 p.m.	80	(5%)	0	(0%)	0	(0%)	\$0	(2%)
1:00-1:59 p.m.	100	(6%)	0	(0%)	0	(0%)	\$0	(3%)
2:00-2:59 p.m.	90	(6%)	0	(0%)	0	(0%)	\$0	(8%)
3:00-3:59 p.m.	90	(6%)	0	(0%)	0	(0%)	\$0	(3%)
4:00-4:59 p.m.	90	(6%)	0	(0%)	0	(0%)	\$0	(28%)
5:00-5:59 p.m.	100	(6%)	0	(0%)	0	(0%)	\$0	(1%)
6:00-6:59 p.m.	90	(6%)	0	(0%)	0	(0%)	\$0	(1%)
7:00-7:59 p.m.	90	(5%)	0	(0%)	0	(0%)	\$0	(1%)
8:00-8:59 p.m.	80	(5%)	0	(0%)	0	(0%)	\$0	(3%)
9:00-9:59 p.m.	70	(4%)	0	(0%)	0	(0%)	\$0	(2%)
10:00-10:59 p.m.	60	(4%)	0	(0%)	0	(0%)	\$0	(2%)
11:00-11:59 p.m.	50	(3%)	0	(0%)	0	(0%)	\$0	(1%)
<b>Total</b>	<b>1,580</b>	<b>(100%)</b>	<b>0</b>	<b>(100%)</b>	<b>0</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 48A.**  
**Non-Trash Outside and Unclassified Fires in Manufacturing Properties**  
**By Time of Day, 2011-20115 Annual Averages**

Time of Day	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight- 12:59 a.m.	70	(3%)	0	(0%)	1	(4%)	\$2	(2%)
1:00-1:59 a.m.	70	(3%)	0	(0%)	0	(0%)	\$2	(2%)
2:00-2:59 a.m.	50	(2%)	0	(0%)	0	(0%)	\$1	(1%)
3:00-3:59 a.m.	50	(2%)	0	(0%)	0	(1%)	\$23	(25%)
4:00-4:59 a.m.	60	(2%)	0	(0%)	1	(7%)	\$1	(1%)
5:00-5:59 a.m.	70	(3%)	0	(0%)	1	(4%)	\$1	(1%)
6:00-6:59 a.m.	80	(3%)	0	(0%)	0	(1%)	\$1	(1%)
7:00-7:59 a.m.	100	(4%)	0	(0%)	1	(4%)	\$1	(2%)
8:00-8:59 a.m.	110	(5%)	0	(0%)	3	(15%)	\$2	(2%)
9:00-9:59 a.m.	110	(4%)	0	(26%)	1	(5%)	\$4	(4%)
10:00-10:59 a.m.	130	(5%)	0	(0%)	1	(3%)	\$1	(1%)
11:00-11:59 a.m.	150	(6%)	0	(0%)	2	(9%)	\$4	(5%)
12:00-12:59 p.m.	140	(6%)	0	(0%)	1	(6%)	\$2	(2%)
1:00-1:59 p.m.	160	(7%)	0	(0%)	1	(7%)	\$20	(22%)
2:00-2:59 p.m.	170	(7%)	0	(31%)	1	(5%)	\$2	(2%)
3:00-3:59 p.m.	160	(6%)	0	(0%)	0	(0%)	\$1	(1%)
4:00-4:59 p.m.	150	(6%)	0	(0%)	0	(2%)	\$9	(10%)
5:00-5:59 p.m.	130	(5%)	0	(0%)	0	(2%)	\$1	(1%)
6:00-6:59 p.m.	110	(4%)	0	(0%)	0	(2%)	\$3	(4%)
7:00-7:59 p.m.	100	(4%)	0	(43%)	1	(8%)	\$3	(3%)
8:00-8:59 p.m.	100	(4%)	0	(0%)	0	(2%)	\$3	(3%)
9:00-9:59 p.m.	90	(4%)	0	(0%)	2	(9%)	\$1	(1%)
10:00-10:59 p.m.	70	(3%)	0	(0%)	0	(0%)	\$3	(3%)
11:00-11:59 p.m.	70	(3%)	0	(0%)	0	(3%)	\$1	(1%)
<b>Total</b>	<b>2,500</b>	<b>(100%)</b>	<b>1</b>	<b>(100%)</b>	<b>18</b>	<b>(100%)</b>	<b>\$93</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 49.**  
**Outside Trash and Rubbish Fires in Industrial Properties**  
**By Leading Cause, 2011-2015 Annual Averages**

<b>Leading Cause</b>	<b>Fires</b>		<b>Direct Property Damage (in Millions)</b>	
Intentional	970	(50%)	\$1	(54%)
Smoking materials	120	(6%)	\$0	(0%)
Torch, burner or soldering iron	70	(4%)	\$0	(2%)
Electrical distribution and lighting equipment	40	(2%)	\$0	(0%)

Note: Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 49A.**  
**Non-Trash Outside and Unclassified Fires in Industrial Properties**  
**By Leading Cause, 2011-2015 Annual Averages**

<b>Leading Cause</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Intentional	3,090	(15%)	1	(25%)	2	(12%)	\$6	(3%)
Lightning	2,190	(11%)	0	(0%)	0	(1%)	\$23	(14%)
Exposure fire	550	(3%)	0	(0%)	0	(2%)	\$3	(2%)
Smoking materials	520	(3%)	0	(0%)	1	(4%)	\$0	(0%)
Torch, burner or soldering iron	380	(2%)	0	(0%)	0	(0%)	\$6	(3%)
Playing with heat source	360	(2%)	0	(0%)	1	(3%)	\$0	(0%)

Note: Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 50.**  
**Outside Trash and Rubbish Fires in Industrial Properties**  
**By Factor Contributing to Ignition, 2011-2015 Annual Averages**

Factor Contributing to Ignition	Fires		Direct Property Damage (in Millions)	
Outside or open fire for debris or waste disposal	560	(29%)	\$0	(15%)
Abandoned or discarded material or product	390	(20%)	\$0	(3%)
Unclassified factor contributed to ignition	170	(9%)	\$0	(3%)
High wind	140	(7%)	\$0	(19%)
Unclassified natural condition	110	(6%)	\$0	(3%)
Agriculture or land management burns	90	(5%)	\$0	(1%)
Rekindle	90	(5%)	\$0	(0%)
Unclassified misuse of material or product	90	(5%)	\$0	(2%)
Fire spread or control, other	70	(4%)	\$0	(3%)
Heat source too close to combustibles	60	(3%)	\$0	(13%)
Outside or open fire for warming or cooking	40	(2%)	\$0	(0%)
Cutting or welding too close to combustibles	40	(2%)	\$0	(0%)
Electrical failure or malfunction	30	(2%)	\$0	(0%)
Other known factor contributing to ignition	140	(7%)	\$1	(40%)
<b>Total fires</b>	<b>1,940</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>
<b>Total factors</b>	<b>2,030</b>	<b>(104%)</b>	<b>\$2</b>	<b>(103%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 50A.  
Non-Trash Outside and Unclassified Fires in Industrial Properties  
By Factor Contributing to Ignition, 2011-2015 Annual Averages**

<b>Factor Contributing to Ignition</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
High wind	3,220	(16%)	0	(8%)	2	(13%)	\$13	(8%)
Outside or open fire for debris or waste disposal	2,300	(11%)	1	(40%)	1	(8%)	\$1	(0%)
Electrical failure or malfunction	2,180	(11%)	0	(8%)	4	(23%)	\$38	(22%)
Unclassified natural condition	1,730	(8%)	0	(0%)	0	(0%)	\$13	(8%)
Storm	1,700	(8%)	0	(0%)	0	(1%)	\$34	(20%)
Agriculture or land management burns	1,580	(8%)	0	(8%)	1	(3%)	\$2	(1%)
Mechanical failure or malfunction	1,580	(8%)	0	(0%)	3	(14%)	\$48	(29%)
Rekindle	1,080	(5%)	0	(0%)	0	(0%)	\$1	(1%)
Unclassified factor contributed to ignition	1,080	(5%)	0	(10%)	0	(1%)	\$9	(5%)
Abandoned or discarded material or product	960	(5%)	0	(0%)	1	(5%)	\$2	(1%)
Fire spread or control, other	860	(4%)	0	(0%)	2	(8%)	\$3	(2%)
Heat source too close to combustibles	840	(4%)	0	(0%)	2	(9%)	\$2	(1%)
Exposure fire	550	(3%)	0	(0%)	0	(2%)	\$3	(2%)
Outside/open fire for warming or cooking	420	(2%)	0	(0%)	0	(2%)	\$0	(0%)
Playing with heat source	360	(2%)	0	(0%)	1	(3%)	\$0	(0%)
Unclassified misuse of material or product	360	(2%)	0	(17%)	1	(5%)	\$2	(1%)
Other known factor contributing to ignition	940	(5%)	0	(8%)	0	(13%)	\$20	(12%)
<b>Total fires</b>	<b>20,710</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>19</b>	<b>(100%)</b>	<b>\$170</b>	<b>(100%)</b>
<b>Total factors</b>	<b>21,750</b>	<b>(105%)</b>	<b>2</b>	<b>(100%)</b>	<b>21</b>	<b>(109%)</b>	<b>\$193</b>	<b>(114%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 51.**  
**Outside Trash and Rubbish Fires in Industrial Properties**  
**By Heat Source, 2011-2015 Annual Averages**

Heat Source	Fires		Direct Property Damage (in Millions)	
Match	290	(15%)	\$0	(0%)
Hot ember or ash	250	(13%)	\$0	(17%)
Unclassified heat source	220	(11%)	\$0	(0%)
Lighter	220	(11%)	\$0	(1%)
Unclassified hot or smoldering object	180	(9%)	\$1	(35%)
Flame or torch used for lighting	160	(8%)	\$0	(2%)
Smoking materials	120	(6%)	\$0	(0%)
Spontaneous combustion or chemical reaction	110	(6%)	\$0	(3%)
Unclassified heat spread from another fire	70	(3%)	\$0	(1%)
Flying brand, ember or spark	60	(3%)	\$0	(23%)
Spark, ember or flame from operating equipment	40	(2%)	\$0	(0%)
Unclassified chemical or natural heat source	40	(2%)	\$0	(0%)
Heat from direct flame or convection currents	30	(2%)	\$0	(2%)
Other known heat source	160	(8%)	\$0	(14%)
<b>Total</b>	<b>1,940</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.



**Table 51A.**  
**Non-Trash Outside and Unclassified Fires in Industrial Properties**  
**By Heat Source, 2011-2015 Annual Averages**

Heat Source	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Hot ember or ash	3,160	(15%)	0	(9%)	2	(10%)	\$2	(1%)
Lightning	2,190	(11%)	0	(0%)	0	(1%)	\$23	(14%)
Arcing	2,150	(10%)	0	(9%)	4	(23%)	\$19	(11%)
Unclassified heat source	1,590	(8%)	0	(9%)	1	(3%)	\$66	(39%)
Spark, ember or flame from operating equipment	1,390	(7%)	0	(0%)	2	(11%)	\$11	(7%)
Flying brand, ember or spark	1,200	(6%)	0	(9%)	2	(8%)	\$1	(0%)
Match	1,170	(6%)	0	(21%)	1	(4%)	\$0	(0%)
Unclassified hot or smoldering object	1,000	(5%)	0	(0%)	0	(2%)	\$4	(2%)
Unclassified heat from powered equipment	870	(4%)	0	(0%)	2	(10%)	\$22	(13%)
Unclassified heat spread from another fire	850	(4%)	0	(9%)	1	(3%)	\$1	(0%)
Flame or torch used for lighting	840	(4%)	0	(0%)	1	(4%)	\$0	(0%)
Lighter	820	(4%)	0	(0%)	1	(4%)	\$0	(0%)
Smoking materials	520	(3%)	0	(0%)	1	(4%)	\$0	(0%)
Radiated or conducted heat from operating equipment	450	(2%)	0	(9%)	1	(3%)	\$3	(2%)
Heat or spark from friction	410	(2%)	0	(11%)	1	(5%)	\$2	(1%)
Heat from direct flame or convection currents	400	(2%)	0	(12%)	0	(1%)	\$0	(0%)
Spontaneous combustion or chemical reaction	310	(2%)	0	(0%)	0	(0%)	\$7	(4%)
Other known heat source	1,390	(7%)	0	(0%)	0	(4%)	\$7	(4%)
<b>Total</b>	<b>20,710</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>19</b>	<b>(100%)</b>	<b>\$170</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 52.**  
**Outside Trash and Rubbish Fires in Industrial Properties**  
**By Item First Ignited, 2011-2015 Annual Averages**

Item First Ignited	Fires		Direct Property Damage (in Millions)	
Rubbish, trash, or waste	590	(30%)	\$0	(22%)
Light vegetation, including grass	280	(14%)	\$0	(2%)
Unclassified organic materials	180	(9%)	\$0	(7%)
Heavy vegetation including trees	140	(7%)	\$0	(1%)
Unclassified item first ignited	130	(7%)	\$0	(24%)
Agricultural crop, including fruits and vegetables	120	(6%)	\$0	(0%)
Multiple items first ignited	80	(4%)	\$0	(10%)
Tire	50	(2%)	\$0	(1%)
Magazine, newspaper, or writing paper	40	(2%)	\$0	(0%)
Flammable or combustible liquids or gases, piping or filter	40	(2%)	\$0	(0%)
Upholstered furniture or vehicle seat	30	(2%)	\$0	(0%)
Box, carton, bag, basket, or barrel	30	(2%)	\$0	(1%)
Other known item first ignited	230	(12%)	\$1	(32%)
<b>Total</b>	<b>1,940</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 52A.**  
**Non-Trash Outside and Unclassified Fires in Industrial Properties**  
**By Heat Source, 2011-2015 Annual Averages**

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Light vegetation, including grass	8,080	(39%)	0	(0%)	4	(20%)	\$4	(2%)
Heavy vegetation including trees	4,200	(20%)	1	(36%)	3	(15%)	\$7	(4%)
Agricultural crop, including fruits and vegetables	2,800	(14%)	0	(0%)	2	(13%)	\$16	(10%)
Unclassified item first ignited	1,120	(5%)	0	(0%)	0	(2%)	\$15	(9%)
Unclassified organic materials	1,100	(5%)	0	(0%)	0	(2%)	\$3	(2%)
Electrical wire or cable insulation	750	(4%)	0	(0%)	0	(2%)	\$74	(43%)
Flammable or combustible liquids or gases, piping or filter	600	(3%)	0	(0%)	7	(36%)	\$36	(21%)
Rubbish, trash, or waste	450	(2%)	0	(16%)	0	(2%)	\$0	(0%)
Transformer or transformer fluids	370	(2%)	0	(16%)	1	(5%)	\$9	(5%)
Fence or pole	360	(2%)	0	(0%)	0	(0%)	\$0	(0%)
Other known item first ignited	870	(4%)	1	(32%)	1	(4%)	\$6	(3%)
<b>Total</b>	<b>20,710</b>	<b>(100%)</b>	<b>2</b>	<b>(100%)</b>	<b>19</b>	<b>(100%)</b>	<b>\$170</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 53.**  
**Outside Trash and Rubbish Fires in Manufacturing Properties**  
**By Leading Cause, 2011-2015 Annual Averages**

<b>Leading Cause</b>	<b>Fires</b>		<b>Direct Property Damage (in Millions)</b>	
Intentional	250	(16%)	\$0	(2%)
Smoking materials	160	(10%)	\$0	(3%)
Torch, burner or soldering iron	100	(6%)	\$0	(0%)
Electrical distribution and lighting equipment	30	(2%)	\$0	(0%)

Note: Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 53A.**  
**Non-Trash Outside and Unclassified Fires in Manufacturing Properties**  
**By Leading Cause, 2011-2015 Annual Averages**

<b>Leading Cause</b>	<b>Fires</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
Electrical distribution and lighting equipment	270	(11%)	4	(22%)	\$3	(3%)
Torch, burner or soldering iron	160	(7%)	2	(10%)	\$2	(2%)
Intentional	100	(4%)	0	(0%)	\$1	(1%)
Smoking materials	60	(2%)	0	(0%)	\$0	(0%)
Cooking equipment	40	(2%)	3	(14%)	\$1	(1%)

Note: Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 54.**  
**Outside Trash and Rubbish Fires in Manufacturing Properties**  
**By Factor Contributing to Ignition, 2011-2015 Annual Averages**

Factor Contributing to Ignition	Fires		Direct Property Damage (in Millions)	
Abandoned or discarded material or product	540	(34%)	\$0	(13%)
Outside or open fire for debris or waste disposal	190	(12%)	\$0	(6%)
Unclassified factor contributed to ignition	120	(7%)	\$0	(1%)
Cutting or welding too close to combustibles	100	(7%)	\$0	(1%)
Unclassified natural condition	90	(6%)	\$0	(2%)
Improper container or storage	90	(5%)	\$0	(1%)
Unclassified misuse of material or product	80	(5%)	\$0	(0%)
High wind	80	(5%)	\$1	(62%)
Heat source too close to combustibles	70	(5%)	\$0	(1%)
Rekindle	60	(4%)	\$0	(1%)
Mechanical failure or malfunction	40	(2%)	\$0	(2%)
Other known factor contributing to ignition	170	(11%)	\$0	(10%)
<b>Total fires</b>	<b>1,580</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>
<b>Total factors</b>	<b>1,630</b>	<b>(103%)</b>	<b>\$2</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 54A.**  
**Non-Trash Outside and Unclassified Fires in Manufacturing Properties**  
**By Factor Contributing to Ignition, 2011-2015 Annual Averages**

Factors Contributing to Ignition	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Mechanical failure or malfunction	690	(28%)	4	(20%)	\$49	(53%)
Electrical failure or malfunction	310	(12%)	6	(36%)	\$25	(27%)
Unclassified factor contributed to ignition	210	(9%)	0	(0%)	\$12	(13%)
Unclassified natural condition	170	(7%)	0	(0%)	\$1	(1%)
Cutting or welding too close to combustibles	150	(6%)	1	(8%)	\$0	(0%)
Failure to clean	140	(5%)	0	(0%)	\$1	(1%)
Heat source too close to combustibles	130	(5%)	0	(0%)	\$1	(1%)
Abandoned or discarded material or product	110	(4%)	0	(2%)	\$1	(1%)
Rekindle	100	(4%)	0	(0%)	\$0	(0%)
High wind	70	(3%)	0	(0%)	\$0	(0%)
Unclassified operational deficiency	70	(3%)	1	(4%)	\$1	(1%)
Unclassified misuse of material or product	60	(2%)	2	(9%)	\$0	(0%)
Outside or open fire for debris or waste disposal	50	(2%)	0	(0%)	\$0	(0%)
Improper container or storage	40	(2%)	0	(0%)	\$1	(1%)
Other known factor contributing to ignition	280	(11%)	0	(24%)	\$3	(3%)
<b>Total fires</b>	<b>2,500</b>	<b>(100%)</b>	<b>18</b>	<b>(100%)</b>	<b>\$93</b>	<b>(100%)</b>
<b>Total factors</b>	<b>2,580</b>	<b>(103%)</b>	<b>19</b>	<b>(102%)</b>	<b>\$94</b>	<b>(102%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 55.**  
**Outside Trash and Rubbish Fires in Manufacturing Properties**  
**By Heat Source, 2011-2015 Annual Averages**

Heat Source	Fires		Direct Property Damage (in Millions)	
Spontaneous combustion or chemical reaction	310	(19%)	\$1	(38%)
Unclassified hot or smoldering object	260	(17%)	\$1	(46%)
Smoking materials	160	(10%)	\$0	(3%)
Hot ember or ash	150	(10%)	\$0	(1%)
Lighter	110	(7%)	\$0	(0%)
Molten or hot material	90	(6%)	\$0	(0%)
Match	80	(5%)	\$0	(0%)
Unclassified heat source	80	(5%)	\$0	(1%)
Spark, ember or flame from operating equipment	80	(5%)	\$0	(3%)
Flame or torch used for lighting	50	(3%)	\$0	(0%)
Unclassified chemical or natural heat source	40	(3%)	\$0	(1%)
Heat or spark from friction	30	(2%)	\$0	(0%)
Unclassified heat from powered equipment	20	(2%)	\$0	(2%)
Other known heat source	110	(7%)	\$0	(5%)
<b>Total</b>	<b>1,580</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 55A.**  
**Non-Trash Outside and Unclassified Fires in Manufacturing Properties**  
**By Heat Source, 2011-2015 Annual Averages**

Heat Source	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified heat from powered equipment	440	(18%)	6	(35%)	\$52	(56%)
Spark, ember or flame from operating equipment	280	(11%)	3	(15%)	\$6	(6%)
Unclassified hot or smoldering object	260	(11%)	2	(10%)	\$3	(3%)
Radiated or conducted heat from operating equipment	240	(9%)	1	(3%)	\$6	(6%)
Arcing	190	(8%)	3	(15%)	\$3	(3%)
Unclassified heat source	170	(7%)	0	(0%)	\$1	(1%)
Hot ember or ash	170	(7%)	1	(3%)	\$7	(7%)
Spontaneous combustion or chemical reaction	160	(6%)	1	(6%)	\$3	(3%)
Heat or spark from friction	140	(6%)	1	(3%)	\$3	(4%)
Molten or hot material	110	(5%)	1	(5%)	\$4	(5%)
Smoking materials	60	(2%)	0	(0%)	\$0	(0%)
Flame or torch used for lighting	50	(2%)	0	(0%)	\$1	(1%)
Unclassified chemical or natural heat source	50	(2%)	0	(0%)	\$2	(2%)
Other known heat source	180	(7%)	0	(5%)	\$3	(3%)
<b>Total</b>	<b>2,500</b>	<b>(100%)</b>	<b>18</b>	<b>(100%)</b>	<b>\$93</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.



**Table 56.**  
**Outside Trash and Rubbish Fires in Manufacturing Properties**  
**By Item First Ignited, 2011-2015 Annual Averages**

Item First Ignited	Fires		Direct Property Damage (in Millions)	
Rubbish, trash, or waste	690	(44%)	\$0	(21%)
Dust, fiber, lint, including sawdust or excelsior	130	(8%)	\$0	(11%)
Unclassified item first ignited	100	(7%)	\$0	(2%)
Multiple items first ignited	100	(6%)	\$0	(5%)
Unclassified organic materials	70	(4%)	\$1	(51%)
Empty pallet or skid	50	(3%)	\$0	(2%)
Flammable or combustible liquids or gases, piping or filter	50	(3%)	\$0	(0%)
Magazine, newspaper, or writing paper	50	(3%)	\$0	(1%)
Light vegetation including grass	40	(2%)	\$0	(2%)
Box, carton, bag, basket, or barrel	30	(2%)	\$0	(0%)
Chips, including wood chips	30	(2%)	\$0	(0%)
Cooking materials, including food	30	(2%)	\$0	(0%)
Palletized material, material stored on pallets	30	(2%)	\$0	(0%)
Other known item first ignited	180	(11%)	\$0	(4%)
<b>Total</b>	<b>1,580</b>	<b>(100%)</b>	<b>\$2</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

**Table 56A.**  
**Non-Trash Outside and Unclassified Fires in Manufacturing Properties**  
**By Item First Ignited, 2011-2015 Annual Averages**

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Flammable or combustible liquids or gases, piping or filter	360	(15%)	9	(48%)	\$49	(53%)
Unclassified item first ignited	360	(14%)	3	(15%)	\$5	(6%)
Dust, fiber, lint, including sawdust or excelsior	340	(14%)	1	(5%)	\$4	(4%)
Light vegetation including grass	280	(11%)	0	(0%)	\$0	(0%)
Unclassified organic materials	200	(8%)	0	(0%)	\$1	(1%)
Electrical wire or cable insulation	130	(5%)	1	(4%)	\$3	(4%)
Material being used to make a product	70	(3%)	1	(3%)	\$1	(2%)
Heavy vegetation including trees	70	(3%)	0	(0%)	\$0	(0%)
Agricultural crop, including fruits and vegetables	70	(3%)	0	(0%)	\$4	(4%)
Chips, including wood chips	60	(3%)	0	(0%)	\$0	(0%)
Rubbish, trash, or waste	60	(3%)	0	(0%)	\$1	(1%)
Conveyor belt, drive belt, or V-belt	50	(2%)	0	(0%)	\$3	(4%)
Other known item first ignited	390	(16%)	4	(25%)	\$18	(20%)
<b>Total</b>	<b>2,500</b>	<b>(100%)</b>	<b>18</b>	<b>(100%)</b>	<b>\$93</b>	<b>(100%)</b>

Note: Sums may not equal totals due to rounding errors. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage is rounded to the nearest million dollars.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

## Appendix A. How National Estimates Statistics Are Calculated

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The statistics in this analysis are estimates derived from the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA's) annual survey of U.S. fire departments. NFIRS is a voluntary system through which participating fire departments report detailed factors about the fires to which they respond. Roughly two-thirds of U.S. fire departments participate, although not all of these departments provide data every year. Fires reported to federal or state fire departments or industrial fire brigades are not included in these estimates.

NFIRS provides the most detailed incident information of any national database not limited to large fires. NFIRS is the only database capable of addressing national patterns for fires of all sizes by specific property use and specific fire cause. NFIRS also captures information on the extent of flame spread, and automatic detection and suppression equipment. For more information about NFIRS visit <https://www.usfa.fema.gov/data/nfirs/>.

NFIRS has a wide variety of data elements and codes. Many code choices describe several conditions. These cannot be broken down further. For example, area of origin code 83 captures fires starting in vehicle engine areas, running gear areas or wheel areas. It is not possible to tell the portion of each from the coded data.

**Methodology may change slightly from year to year.** NFPA is continually examining its methodology to provide the best possible answers to specific questions. From time to time, changes are made to methodologies or groupings. *Earlier editions of the same report may have used different methodologies to produce the same analysis, meaning that the estimates are not directly comparable from year to year.* Readers should use the latest report available and contact us if clarification is needed.

**NFPA's fire department experience survey provides estimates of the big picture.** Each year, NFPA conducts an annual survey of fire departments which enables us to capture a summary of fire department experience on a larger scale. Surveys are sent to all municipal departments protecting populations of 5,000 or more and a random sample, stratified by community size, of the smaller departments. Typically, a total of roughly 3,000 surveys are returned, representing about one of every ten U.S. municipal fire departments serving about one third of the U.S. population.

The survey is stratified by size of population protected to reduce the uncertainty of the final estimate. Small rural communities have fewer people protected per department and are less likely to respond to the survey. A larger number must be surveyed to obtain an adequate sample of those departments. (NFPA also makes follow-up calls to a sample of the smaller fire departments that do not respond, to confirm that those that did respond are truly representative of fire departments their size.) On the other hand, large city departments are so few in number and protect such a large proportion of the total U.S. population that it makes sense to survey all of them. Most respond, resulting in excellent precision for their part of the final estimate.

The survey includes the following information: (1) the total number of fire incidents, civilian deaths, and civilian injuries, and the total estimated property damage (in dollars), for each of the major property use classes defined in NFIRS; (2) the number of on-duty firefighter injuries, by type of duty and nature of illness; (3) the number and nature of non-fire incidents; and (4) information on the type of community protected (e.g., county versus township versus city) and the size of the population protected, which is used in the statistical formula for projecting national totals from sample results. The results of the survey are published in the annual report [Fire Loss in the United States](#).

## PROJECTING NFIRS TO NATIONAL ESTIMATES

**As noted, NFIRS is a voluntary reporting system.** Different states and jurisdictions have different reporting requirements and practices. Participation rates in NFIRS are not necessarily uniform across regions and community sizes, both factors correlated with frequency and severity of fires. This means NFIRS may be susceptible to systematic biases. No one at present can quantify the size of these deviations from the ideal, representative sample. But there is enough reason for concern so that a second database -- the NFPA's fire experience survey -- is needed to project NFIRS to national estimates and to project different parts of NFIRS separately. This multiple calibration approach makes use of the annual NFPA's fire experience survey where its statistical design advantages are strongest.

Scaling ratios are obtained by comparing NFPA's projected totals of residential structure fires, non-residential structure fires, vehicle fires, and outside and other fires, and associated civilian deaths, civilian injuries, and direct property damage with comparable totals in NFIRS. Estimates of specific fire problems and circumstances are obtained by multiplying the NFIRS data by the scaling ratios. Reports for incidents in which mutual aid was given are excluded from NFPA's analyses.

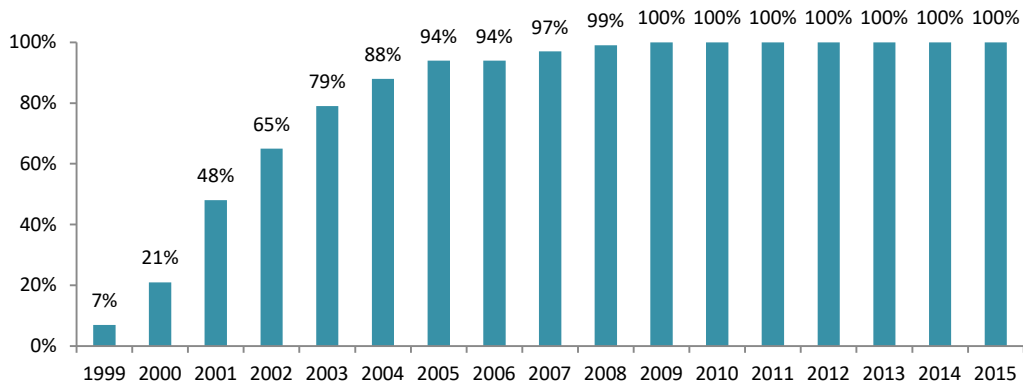
Analysts at the NFPA, the USFA and the Consumer Product Safety Commission developed the analytical rules used in analyzing data from the two data sets. ["The National Estimates Approach to U.S. Fire Statistics."](#) by John R. Hall, Jr. and Beatrice Harwood, provides a more detailed explanation of national estimates.

Version 5.0 of NFIRS, first introduced in 1999, used a different coding structure for many data elements, added some property use codes, and dropped others. The essentials of the approach described by Hall and Harwood are still used, but some modifications have been necessary to accommodate the changes in NFIRS 5.0. For 2002 data on, analyses are based on scaling ratios using only data originally collected in NFIRS 5.0:

### NFPA's fire experience survey projections NFIRS totals (Version 5.0)

For 1999 to 2001, the same rules may be applied, but estimates for these years in this form will be less reliable due to the smaller amount of data originally collected in NFIRS 5.0; they should be viewed with extreme caution.

**Figure A.1. Fires Originally Collected in NFIRS 5.0 by Year**



NFIRS 5.0 introduced six categories of confined structure fires, including:

- cooking fires confined to the cooking vessel,
- confined chimney or flue fires,
- confined incinerator fire,
- confined fuel burner or boiler fire or delayed ignition,
- confined commercial compactor fire, and
- trash or rubbish fires in a structure with no flame damage to the structure or its contents.

Although causal and other detailed information is typically not required for these incidents, it is provided in some cases. Some analyses, particularly those that examine cooking equipment, heating equipment, fires caused by smoking materials, and fires started by playing with fire, may examine the confined fires in greater detail. Because the confined fire incident types describe certain scenarios, the distribution of unknown data differs from that of all fires. Consequently, allocation of unknowns must be done separately. Some analyses of structure fires show only non-confined fires. In these tables, percentages shown are of non-confined structure fires rather than all structure fires. This approach has the advantage of showing the frequency of specific factors in fire causes, but the disadvantage of possibly overstating the percentage of factors that are seldom seen in the confined fire incident types and of understating the factors specifically associated with the confined fire incident types. Other analyses include entries for confined fire incident types in the causal tables and show percentages based on total structure fires. In these cases, the confined fire incident type is treated as a general causal factor.

For most fields other than Property Use and Incident Type, NFPA allocates unknown data proportionally among known data. This approach assumes that if the missing data were known, it would be distributed in the same manner as the known data. NFPA makes additional adjustments to several fields. *Casualty and loss projections can be heavily influenced by the inclusion or exclusion of unusually serious fire.*

## **SPECIFIC DATA ELEMENTS**

In the formulas that follow, the term “all fires” refers to all fires in NFIRS on the dimension studied. The percentages of fires with known or unknown data are provided for non-confined fires and associated losses, and for confined fires only.

**Cause of Ignition:** This field is used chiefly to identify intentional fires. “Unintentional” in this field is a specific entry and does not include other fires that were not intentionally set: failure of equipment or heat source, act of nature, or “other” (unclassified).” The last should be used for exposures but has been used for other situations as well. Fires that were coded as under investigation and those that were coded as undetermined after investigation were treated as unknown.

**Factor Contributing to Ignition:** In this field, the code “none” is treated as an unknown and allocated proportionally. For Human Factor Contributing to Ignition, NFPA enters a code for “not reported” when no factors are recorded. “Not reported” is treated as an unknown, but the code “none” is treated as a known code and not allocated. Multiple entries are allowed in both of these fields. Percentages are calculated on the total number of fires, not entries, resulting in sums greater than 100%. Although Factor Contributing to Ignition is only required when the cause of ignition was coded as: 2) unintentional, 3) failure of equipment or heat source; or 4) act of nature, data is often present when not required. Consequently, any fire in which no factor contributing to ignition was entered was treated as unknown.

In some analyses, all entries in the category of mechanical failure, malfunction (factor contributing to ignition 20-29) are combined and shown as one entry, “mechanical failure or malfunction.” This category includes:

21. Automatic control failure;
22. Manual control failure;
23. Leak or break. Includes leaks or breaks from containers or pipes. Excludes operational deficiencies and spill mishaps;
25. Worn out;
26. Backfire. Excludes fires originating as a result of hot catalytic converters;
27. Improper fuel used; Includes the use of gasoline in a kerosene heater and the like; and
20. Mechanical failure or malfunction, other.

Entries in “electrical failure, malfunction” (factor contributing to ignition 30-39) may also be combined into one entry, “electrical failure or malfunction.” This category includes:

31. Water-caused short circuit arc;
32. Short-circuit arc from mechanical damage;
33. Short-circuit arc from defective or worn insulation;
34. Unspecified short circuit arc;
35. Arc from faulty contact or broken connector, including broken power lines and loose connections;
36. Arc or spark from operating equipment, switch, or electric fence;
37. Fluorescent light ballast; and
30. Electrical failure or malfunction, other.

**Heat Source.** In NFIRS 5.0, one grouping of codes encompasses various types of open flames and smoking materials. In the past, these had been two separate groupings. A new code was added to NFIRS 5.0, which is code 60: “Heat from open flame or smoking material, other.” NFPA treats this code as a partial unknown and allocates it proportionally across the codes in the 61-69 range, shown below.

61. Cigarette;
62. Pipe or cigar;
63. Heat from undetermined smoking material;
64. Match;
65. Lighter: cigarette lighter, cigar lighter;
66. Candle;
67. Warning or road flare, fuse;
68. Backfire from internal combustion engine. Excludes flames and sparks from an exhaust system, (11); and
69. Flame/torch used for lighting. Includes gas light and gas-/liquid-fueled lantern.

In addition to the conventional allocation of missing and undetermined fires, NFPA multiplies fires with codes in the 61-69 range by

$$\frac{\text{All fires in range 60-69}}{\text{All fires in range 61-69}}$$

The downside of this approach is that heat sources that are truly a different type of open flame or smoking material are erroneously assigned to other categories. The grouping “smoking materials” includes codes 61-63 (cigarettes, pipes or cigars, and heat from undetermined smoking material, with a proportional share of the code 60s and true unknown data.

**Equipment Involved in Ignition (EII).** NFIRS 5.0 originally defined EII as the piece of equipment that provided the principal heat source to cause ignition if the equipment malfunctioned or was used improperly. In 2006, the definition was modified to “the piece of equipment that provided the principal heat source to cause ignition.” However, much of the data predates the change. Individuals who have already been trained with the older definition may not change their practices. To compensate, NFPA treats fires in which EII = NNN and heat source is not in the range of 40-99 as an additional unknown.

To allocate unknown data for EII, the known data is multiplied by

All fires

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(All fires – blank – undetermined – [fires in which EII =NNN and heat source <>40-99])

In addition, the partially unclassified codes for broad equipment groupings (i.e., code 100 - heating, ventilation, and air conditioning, other; code 200 - electrical distribution, lighting and power transfer, other; etc.) were allocated proportionally across the individual code choices in their respective broad groupings (heating, ventilation, and air conditioning; electrical distribution, lighting and power transfer, other; etc.). Equipment that is totally unclassified is not allocated further. This approach has the same downside as the allocation of heat source 60 described above. Equipment that is truly different is erroneously assigned to other categories.

In some analyses, various types of equipment are grouped together.

<b>Code Grouping</b>	<b>EII Code</b>	<b>NFIRS definitions</b>
Central heat	132	Furnace or central heating unit
	133	Boiler (power, process or heating)
Fixed or portable space heater	131	Furnace, local heating unit, built-in
	123	Fireplace with insert or stove
	124	Heating stove
	141	Heater, excluding catalytic and oil-filled
	142	Catalytic heater
	143	Oil-filled heater
Fireplace or chimney	120	Fireplace or chimney
	121	Fireplace, masonry
	122	Fireplace, factory-built
	125	Chimney connector or vent connector
	126	Chimney – brick, stone or masonry
	127	Chimney-metal, including stovepipe or flue
Fixed wiring and related equipment	210	Unclassified electrical wiring
	211	Electrical power or utility line
	212	Electrical service supply wires from utility
	213	Electric meter or meter box
	214	Wiring from meter box to circuit breaker
	215	Panel board, switch board or circuit breaker board
	216	Electrical branch circuit

	217	Outlet or receptacle
	218	Wall switch
	219	Ground fault interrupter
Transformers and power supplies	221	Distribution-type transformer
	222	Overcurrent, disconnect equipment
	223	Low-voltage transformer
	224	Generator
	225	Inverter
	226	Uninterrupted power supply (UPS)
	227	Surge protector
	228	Battery charger or rectifier
	229	Battery (all types)

### Code Grouping

Lamp, bulb or lighting

### EII Code

### NFIRS definitions

	230	Unclassified lamp or lighting
	231	Lamp-tabletop, floor or desk
	232	Lantern or flashlight
	233	Incandescent lighting fixture
	234	Fluorescent light fixture or ballast
	235	Halogen light fixture or lamp
	236	Sodium or mercury vapor light fixture or lamp
	237	Work or trouble light
	238	Light bulb
	241	Nightlight
	242	Decorative lights – line voltage
	243	Decorative or landscape lighting – low voltage
	244	Sign
Cord or plug	260	Unclassified cord or plug
	261	Power cord or plug, detachable from appliance
	262	Power cord or plug- permanently attached
	263	Extension cord
Torch, burner or soldering iron	331	Welding torch
	332	Cutting torch
	333	Burner, including Bunsen burners
	334	Soldering equipment
Portable cooking or warming equipment	631	Coffee maker or teapot
	632	Food warmer or hot plate
	633	Kettle
	634	Popcorn popper
	635	Pressure cooker or canner



636	Slow cooker
637	Toaster, toaster oven, counter-top broiler
638	Waffle iron, griddle
639	Wok, frying pan, skillet
641	Breadmaking machine

**Area of Origin.** Two areas of origin: bedroom for more than five people (code 21) and bedroom for less than five people (code 22) are combined and shown as simply “bedroom.” Chimney is no longer a valid area of origin code for non-confined fires.

**Item First Ignited.** In most analyses, mattress and pillows (item first ignited 31) and bedding, blankets, sheets, and comforters (item first ignited 32) are combined and shown as “mattresses and bedding.” In many analyses, wearing apparel not on a person (code 34) and wearing apparel on a person (code 35) are combined and shown as “clothing.” In some analyses, flammable and combustible liquids and gases, piping and filters (item first ignited 60-69) are combined and shown together.

**Extent of Fire Spread.** All structure fires with incident types indicating a confined fire were shown separately and are assumed to be confined to the object of origin. Fires that spread beyond the room of origin are calculated by summing fires with damage:

- a) confined to the floor of origin (code 3),
- b) confined to the building of origin (code 4), and
- c) extending beyond building of origin (code 5).

**Rounding and percentages.** The data shown are estimates and generally rounded. An entry of zero may be a true zero or it may mean that the value rounds to zero. Percentages are calculated from unrounded values. It is quite possible to have a percentage entry of up to 100% even if the rounded number entry is zero. The same rounded value may account for a slightly different percentage share. Because percentages are expressed in integers and not carried out to several decimal places, percentages that appear identical may be associated with slightly different values.

**Inflation.** Property damage estimates are not adjusted for inflation unless so indicated.

## Appendix B. Methodology and Definitions Used in “Leading Cause” Tables

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The cause table reflects relevant causal factors that accounted for at least 2% of the fires in a given occupancy. Only those causes that seemed to describe a scenario are included. Because the causal factors are taken from different fields, some double counting is possible. Percentages are calculated against the total number of structure fires, including both confined and non-confined fires. Bear in mind that every fire has at least three “causes” in the sense that it could have been prevented by changing behavior, heat source, or ignitability of first fuel, the last an aspect not reflected in any of the major cause categories. For example, several of the cause categories in this system refer to types of equipment (cooking, heating, electrical distribution and lighting, clothes dryers and washers, torches). However, the problem may be not with the equipment but with the way it is used. The details in national estimates are derived from the U.S. Fire Administration’s National Fire Incident Reporting System (NFIRS). This methodology is based on the coding system used in Version 5.0 of NFIRS. The *NFIRS 5.0 Reference Guide*, containing all of the codes, can be downloaded from <http://www.nfirs.fema.gov/documentation/reference/>.

**Cooking equipment and heating equipment** are calculated by summing fires identified by equipment involved in ignition and relevant confined fires. Confined fires will be shown if they account for at least 2% of the incidents. **Confined cooking fires** (cooking fires involving the contents of a cooking vessel without fire extension beyond the vessel) are identified by NFIRS incident type 113.

**Confined heating equipment** fires include **confined chimney or flue fires** (incident type 114) and **confined fuel burner or boiler** fires (incident type 116). The latter includes delayed ignitions and incidents where flames caused no damage outside the fire box. The two types of confined heating fires may be combined or listed separately, depending on the numbers involved.

**Intentional** fires are identified by fires with a “1” (intentional) in the field “cause.” The estimate includes a proportional share of fires in which the cause was undetermined after investigation, under investigation, or not reported. All fires with intentional causes are included in this category regardless of the age of the person involved. Earlier versions of NFIRS included codes for incendiary and suspicious. Intentional fires were deliberately set; they may or may not be incendiary in a legal sense. No age restriction is applied.

Fires caused by **playing with heat source** (typically matches or lighters) are identified by code 19 in the field “factor contributing to ignition.” Fires in which the factor contribution to ignition was undetermined (UU), entered as none (NN) or left blank are considered unknown and allocated proportionally. Because factor contributing to ignition is not required for intentional fires, the share unknown, by these definitions, is somewhat larger than it should be.

The heat source field is used to identify fires started by: **smoking materials** (cigarette, code 61; pipe or cigar, code 62; and heat from undetermined smoking material, code 63); **candles** (code 66), **lightning** (code 73); and **spontaneous combustion or chemical reaction** (code 72). Fires started by heat from unclassified open flame or smoking materials (code 60) are allocated proportionally among the “other open flame or smoking material” codes (codes 61-69) in an allocation of partial unknown data. This includes smoking materials and candles. This approach results in any true unclassified smoking or open flame heat sources such as incense being inappropriately allocated. However, in many fires, this code was used as an unknown.

The equipment involved in ignition field is used to find several cause categories. This category includes equipment that functioned properly and equipment that malfunctioned.

**Cooking equipment Non-confined fire** refers to equipment used to cook, heat or warm food (codes 620-649 and 654). Fire in which ranges, ovens or microwave ovens, food warming appliances, fixed or portable cooking appliances, deep fat fryers, open fired charcoal or gas grills, grease hoods or ducts, or other cooking appliances) were involved in the ignition are said to be caused by cooking equipment. Food preparation devices that do not involve heating, such as can openers or food processors, are not included here. As noted in Appendix A, a proportional share of unclassified kitchen and cooking equipment (code 600) is included here.

**Heating equipment Non-confined fire** (codes 120-199) includes central heat, portable and fixed heaters (including wood stoves), fireplaces, chimneys, hot water heaters, and heat transfer equipment such as hot air ducts or hot water pipes. Heat pumps are not included. As noted in Appendix A, a proportional share of unclassified heating, ventilation and air condition equipment (code 100) is included here.

Confined fires are excluded from the tallies of the remaining categories of fires involving equipment.

**Electrical distribution and lighting equipment** (codes 200-299) include: fixed wiring; transformers; associated overcurrent or disconnect equipment such as fuses or circuit breakers; meters; meter boxes; power switch gear; switches, receptacles and outlets; light fixtures, lamps, bulbs or lighting; signs; cords and plugs; generators, transformers, inverters, batteries and battery charges.

**Torch, burner or soldering iron** (codes 331-334) includes welding torches, cutting torches, Bunsen burners, plumber furnaces, blowtorches, and soldering equipment. As noted in Appendix A, a proportional share of shop tools and industrial equipment (code 300) is included here.

**Clothes dryer or washer** (codes 811, 813 and 814) includes clothes dryers alone, washer and dryer combinations within one frame, and washing machines for clothes. As noted in Appendix A, a proportional share of unclassified personal and household equipment (code 800) is included here.

**Electronic, office or entertainment equipment** (codes 700-799) includes: computers and related equipment; calculators and adding machines; telephones or answering machines; copiers; fax machines; paper shredders; typewriters; postage meters; other office equipment; musical instruments; stereo systems and/or components; televisions and cable TV converter boxes, cameras, excluding professional television studio cameras, video equipment and other electronic equipment. Older versions of NFIRS had a code for electronic equipment that included radar, X-rays, computers, telephones, and transmitter equipment.

**Shop tools and industrial equipment excluding torches, burners or soldering irons** (codes 300-330, 335-399) includes power tools; painting equipment; compressors; atomizing equipment; pumps; wet/dry vacuums; hoists, lifts or cranes; powered jacking equipment; water or gas drilling equipment; unclassified hydraulic equipment; heat-treating equipment; incinerators, industrial furnaces, ovens or kilns; pumps; compressors; internal combustion engines; conveyors; printing presses; casting, molding; or forging equipment; heat treating equipment; tar kettles; working or shaping machines; coating machines; chemical process equipment; waste recovery equipment; power transfer equipment; power takeoff; powered valves; bearings or brakes; picking, carding or weaving machines; testing equipment; gas regulators; separate motors; non-vehicular internal combustion engines; and unclassified shop tools and industrial equipment. . As noted in Appendix A, a proportional share of shop tools and industrial equipment (code 300) is included here.

**Medical equipment** (codes 410-419) includes: dental, medical or other powered bed, chair or wheelchair; dental equipment; dialysis equipment; medical monitoring and imaging equipment; oxygen administration equipment; radiological equipment; medical sterilizers, therapeutic equipment and unclassified medical equipment. As noted in Appendix A, a proportional share of commercial and medical equipment (code 400) is included here.

**Exposures** are fires that are caused by the spread of or from another fire. These were identified by factor contributing to ignition code 71. This code is automatically applied when the exposure number is greater than zero.