RESEARCH

Structure Fires Caused by Hot Work

Supporting Tables

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Structure Fires Caused by Hot Work: Supporting Tables

The tables in this document are a companion to the report of the same name. Estimates of home and non-home fires caused by hot work are shown separately for each table. The table topics are listed below.

The national estimates of fires and losses in this analysis are presented as 2014–2018 annual averages. Estimates were derived from the US Fire Administration's National Fire Incident Reporting System (NFIRS) and NFPA's annual fire department experience survey and include proportional shares of unknown or missing data. Fires are rounded to the nearest 10, deaths and injuries are rounded to the nearest one, and property loss is rounded to the nearest million dollars. Property loss was not adjusted for inflation. Percentages were calculated on unrounded estimates. Sums may not equal totals due to rounding errors.

Confined fires (fires with NFIRS incident type codes 113–118 indicating 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) were excluded from this analysis. Estimates include proportional shares of fires with unknown data. For more information on how these estimates were calculated, please see the full report and *How NFPA's National Estimates Are Calculated for Fires.*

Table 1A. Structure Fires Caused by Hot Work by Broad Occupancy: 2014–2018 Annual Averages

Occupancy	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Home	1,980	(43%)	16	(75%)	85	(50%)	$106	(22%)
Non-home	2,600	(57%)	5	(25%)	86	(50%)	$378	(78%)
Total	4,580	(100%)	22	(100%)	171	(100%)	$484	(100%)

Table 1B. Home Structure Fires Caused by Hot Work by Occupancy: 2014–2018 Annual Averages

Occupancy	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
One- or two-family home	1,430	(72%)	16	(100%)	61	(71%)	$53	(50%)
Apartment or multifamily home	550	(28%)	0	(0%)	25	(29%)	$53	(40%)
Total	1,980	(100%)	16	(100%)	85	(100%)	$106	(100%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident types 113–118) were excluded from this analysis.

Source: NFIRS 5.0 and NFPA's fire experience survey.

Table 1C. Non-Home Structure Fires Caused by Hot Work by Occupancy: 2014–2018 Annual Averages

Occupancy	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Manufacturing or processing	680	(26%)	0	(0%)	23	(27%)	$135	(36%)
Mercantile or office	570	(22%)	1	(22%)	22	(26%)	$28	(7%)
Service station or vehicle sales, service, or repair	170	(6%)	1	(22%)	10	(12%)	$16	(4%)
Office, bank, or mail facility	110	(4%)	0	(0%)	1	(1%)	$1	(0%)
Specialty shop	60	(2%)	0	(0%)	0	(0%)	$3	(1%)
Grocery or convenience store	40	(2%)	0	(0%)	4	(5%)	$1	(0%)
Laundry, dry cleaning, professional supplies, or services	30	(1%)	0	(0%)	5	(5%)	$2	(1%)
Department store or unclassified general retail	30	(1%)	0	(0%)	2	(2%)	$0	(0%)
Personal service, recreational, or home repair	20	(1%)	0	(0%)	0	(0%)	$1	(0%)
Unclassified or unknown-type mercantile or business	90	(4%)	0	(0%)	0	(0%)	$3	(1%)
Storage property	550	(21%)	4	(78%)	13	(15%)	$29	(8%)
Vehicle storage, garage, or fire station	170	(6%)	2	(35%)	8	(9%)	$12	(3%)
Warehouse, residential, or self-storage	110	(4%)	0	(0%)	0	(0%)	$4	(1%)
Grain or livestock storage	20	(1%)	0	(0%)	0	(0%)	$5	(1%)
Unclassified storage property	240	(9%)	2	(43%)	5	(6%)	$8	(2%)
Residential property	190	(7%)	0	(0%)	6	(7%)	$31	(8%)
Hotel or motel	70	(3%)	0	(0%)	0	(0%)	$28	(7%)
Dormitory, fraternity, sorority, or barracks	10	(1%)	0	(0%)	3	(3%)	$0	(0%)
Unclassified or unknown-type residential property	90	(4%)	0	(0%)	3	(3%)	$2	(1%)

Table 1C. Non-Home Structure Fires Caused by Hot Work by Occupancy: 2014–2018 Annual Averages (Continued)

Occupancy	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Public assembly	170	(7%)	0	(0%)	2	(3%)	$21	(5%)
Eating or drinking establishment	80	(3%)	0	(0%)	1	(2%)	$6	(2%)
Place of worship or funeral property	40	(1%)	0	(0%)	0	(0%)	$3	(1%)
Library, museum, courthouse, or other public property	20	(1%)	0	(0%)	0	(0%)	$11	(3%)
Industrial, utility, defense, agriculture, or mining	120	(5%)	0	(0%)	8	(10%)	$23	(6%)
Agriculture	20	(1%)	0	(0%)	0	(0%)	$7	(2%)
Utility or distribution system	20	(1%)	0	(0%)	7	(9%)	$0	(0%)
Laboratory	10	(1%)	0	(0%)	0	(0%)	$1	(0%)
Unclassified utility, defense, agriculture, or mining	50	(2%)	0	(0%)	1	(1%)	$15	(4%)
Outside or special property	100	(4%)	0	(0%)	0	(0%)	$7	(2%)
Construction site or oil/gas field	50	(2%)	0	(0%)	0	(0%)	$2	(1%)
Bridge, tunnel, or outbuilding	20	(1%)	0	(0%)	0	(0%)	$4	(1%)
Highway, street, or parking area	10	(1%)	0	(0%)	0	(0%)	$0	(0%)
Educational property	100	(4%)	0	(0%)	3	(4%)	$99	(26%)
Preschool through grade 12	60	(2%)	0	(0%)	3	(4%)	$7	(2%)
Adult education or college classroom	20	(1%)	0	(0%)	0	(0%)	$84	(22%)
Health care, detention, or correction	90	(3%)	0	(0%)	6	(7%)	$1	(0%)
Hospital or hospice	30	(1%)	0	(0%)	1	(2%)	$1	(0%)
Clinic or doctor's office	20	(1%)	0	(0%)	3	(3%)	$0	(0%)
Prison, jail, or police station	10	(1%)	0	(0%)	1	(1%)	$0	(0%)
Unclassified or unknown property use	50	(2%)	0	(0%)	2	(2%)	$3	(1%)
Total	2,600	(100%)	5	(100%)	86	(100%)	$378	(100%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident types 113–118) were excluded from this analysis. Only occupancies with rounded totals of at least 1 percent of the fires are shown.

Source: NFIRS 5.0 and NFPA's fire experience survey.

Table 2A. Home Structure Fires Caused by Hot Work by Equipment Involved in Ignition: 2014–2018 Annual Averages

Equipment Involved	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Soldering equipment	650	(33%)	2	(11%)	26	(30%)	$24	(23%)
Welding torch	620	(31%)	4	(22%)	30	(36%)	$45	(43%)
Cutting torch	260	(13%)	0	(0%)	10	(12%)	$15	(14%)
Burner	260	(13%)	5	(34%)	14	(17%)	$11	(11%)
Heat-treating equipment	160	(8%)	5	(33%)	4	(4%)	$10	(9%)
Tar pot or tar kettle	10	(1%)	0	(0%)	1	(1%)	$1	(1%)
Power nail gun, stud driver, or stapler	0	(0%)	0	(0%)	0	(0%)	$0	(0%)
Total	1,980	(100%)	16	(100%)	85	(100%)	$106	(100%)

Table 2B. Non-Home Structure Fires Caused by Hot Work by Equipment Involved in Ignition: 2014–2018 Annual Averages

Equipment Involved	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Welding torch	1,030	(40%)	5	(2%)	26	(2%)	$111	(3%)
Cutting torch	660	(25%)	0	(0%)	20	(1%)	$59	(2%)
Heat-treating equipment	490	(19%)	0	(0%)	20	(1%)	$73	(2%)
Burner	250	(9%)	0	(0%)	17	(1%)	$95	(3%)
Soldering equipment	150	(6%)	0	(0%)	2	(0%)	$39	(1%)
Tar pot or tar kettle	20	(1%)	0	(0%)	0	(0%)	$0	(0%)
Power nail gun, stud driver, or stapler	0	(0%)	0	(0%)	0	(0%)	$0	(0%)
Total	2,600	(100%)	5.48	(100%)	86	(100%)	$378	(100%)

Note: Fires in which the equipment involved in ignition was unknown or not reported have been allocated proportionally among fires with known equipment involved. 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 the fires with known equipment involved. Fires with unclassified shop tools and industrial equipment (NFIRS "equipment involved in ignition" code 300) were allocated proportionally among fires, specific shop tools, and industrial equipment. Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident types 113–118) were excluded from this analysis.

Source: NFIRS 5.0 and NFPA's fire experience survey.

Table 3A. Home Structure Fires Caused by Hot Work by Structure Status: 2014–2018 Annual Averages

Structure Status	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
In normal use	1,640	(83%)	16	(100%)	81	(96%)	$77	(72%)
Under construction	130	(7%)	0	(0%)	2	(2%)	$22	(21%)
Under major renovation	110	(5%)	0	(0%)	2	(2%)	$5	(5%)
Vacant and secured	50	(2%)	0	(0%)	0	(0%)	$1	(1%)
Being demolished	20	(1%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified structure status	10	(1%)	0	(0%)	0	(0%)	$0	(0%)
Idle or not routinely used	10	(1%)	0	(0%)	0	(0%)	$1	(1%)
Vacant and unsecured	10	(0%)	0	(0%)	0	(0%)	$0	(0%)
Total	1,980	(100%)	16	(100%)	85	(100%)	$106	(100%)

Table 3B. Non-Home Structure Fires Caused by Hot Work by Structure Status: 2014–2018 Annual Averages

Structure Status	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
In normal use	2,080	(80%)	5	(100%)	83	(98%)	$324	(86%)
Under construction	200	(8%)	0	(0%)	1	(1%)	$18	(5%)
Under major renovation	140	(6%)	0	(0%)	1	(1%)	$32	(8%)
Being demolished	60	(2%)	0	(0%)	0	(0%)	$1	(0%)
Vacant and secured	50	(2%)	0	(0%)	0	(0%)	$1	(0%)
Idle or not routinely used	30	(1%)	0	(0%)	0	(0%)	$1	(0%)
Unclassified structure status	30	(1%)	0	(0%)	0	(0%)	$0	(0%)
Vacant and unsecured	10	(0%)	0	(0%)	0	(0%)	$1	(0%)
Total	2,600	(100%)	5	(100%)	86	(100%)	$378	(100%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident types 113–118) were excluded from this analysis.

Source: NFIRS 5.0 and NFPA's fire experience survey.

Table 4A. Home Structure Fires Caused by Hot Work by Area of Origin: 2014–2018 Annual Averages

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Wall assembly or concealed space	310	(16%)	0	(0%)	9	(10%)	$16	(15%)
Bathroom or lavatory	260	(13%)	0	(0%)	16	(19%)	$12	(12%)
Kitchen or cooking area	150	(7%)	2	(11%)	9	(10%)	$4	(4%)
Exterior roof surface	140	(7%)	0	(0%)	5	(6%)	$9	(8%)
Garage or vehicle storage area	140	(7%)	2	(11%)	12	(14%)	$8	(8%)
Exterior wall surface	130	(7%)	0	(0%)	0	(0%)	$15	(14%)
Crawl space or substructure space	110	(6%)	2	(11%)	9	(11%)	$3	(3%)
Attic or ceiling/roof assembly or concealed space	80	(4%)	0	(0%)	1	(1%)	$11	(10%)
Ceiling/floor assembly or concealed space	70	(4%)	0	(0%)	3	(3%)	$1	(1%)
Bedroom	60	(3%)	4	(22%)	6	(7%)	$4	(4%)
Laundry room or area	50	(2%)	0	(0%)	0	(0%)	$1	(1%)
Exterior balcony or unenclosed porch	40	(2%)	0	(0%)	0	(0%)	$0	(0%)
Unclassified outside area	30	(2%)	0	(0%)	0	(0%)	$1	(1%)
Living room	30	(2%)	2	(11%)	0	(0%)	$0	(0%)
Unclassified function area	30	(2%)	0	(0%)	1	(1%)	$0	(0%)
Other known area	340	(17%)	5	(34%)	15	(18%)	$19	(18%)
Total	1,980	(100%)	16	(100%)	85	(100%)	$106	(100%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident type 113–118) were excluded from this analysis.

Source: NFIRS 5.0 and NFPA's fire experience survey.

Table 4B. Non-Home Structure Fires Caused by Hot Work by Area of Origin: 2014–2018 Annual Averages

Area of Origin	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Exterior roof surface	300	(12%)	0	(0%)	2	(2%)	$110	(29%)
Processing or manufacturing area or workroom	280	(11%)	1	(22%)	9	(10%)	$109	(29%)
Maintenance or paint shop area	200	(8%)	1	(22%)	16	(19%)	$19	(5%)
Garage or vehicle storage area	170	(6%)	2	(35%)	8	(9%)	$14	(4%)
Unclassified equipment or service area	120	(5%)	0	(0%)	3	(4%)	$12	(3%)
Wall assembly or concealed space	120	(5%)	0	(0%)	2	(2%)	$18	(5%)
Machinery room or area or elevator machinery room	100	(4%)	0	(0%)	1	(1%)	$8	(2%)
Unclassified storage area	90	(3%)	0	(0%)	1	(1%)	$3	(1%)
Exterior wall surface	80	(3%)	0	(0%)	3	(3%)	$2	(0%)
Ceiling/floor assembly or concealed space	70	(3%)	0	(0%)	1	(1%)	$11	(3%)
Construction or renovation area	60	(2%)	0	(0%)	0	(0%)	$2	(1%)
Unclassified structural area	60	(2%)	0	(0%)	0	(0%)	$12	(3%)
Storage room, area, tank, or bin	60	(2%)	0	(0%)	1	(1%)	$0	(0%)
Storage of supplies or tools or dead storage	50	(2%)	0	(0%)	3	(3%)	$0	(0%)
Attic or ceiling/roof assembly or concealed space	40	(2%)	0	(0%)	2	(3%)	$1	(0%)
Unclassified outside area	40	(2%)	0	(0%)	0	(0%)	$1	(0%)
Duct for HVAC, cable, exhaust, heating, or AC	40	(2%)	0	(0%)	1	(2%)	$1	(0%)
Kitchen or cooking area	40	(2%)	0	(0%)	1	(2%)	$0	(0%)
Other known area	660	(25%)	1	(22%)	31	(36%)	$53	(14%)
Total	2,600	(100%)	5	(100%)	86	(100%)	$378	(100%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident types 113–118) were excluded from this analysis.

Source: NFIRS 5.0 and NFPA's fire experience survey.

Table 5A. Home Structure Fires Caused by Hot Work by Item First Ignited: 2014–2018 Annual Averages

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Structural member or framing	470	(24%)	5	(33%)	18	(21%)	$25	(24%)
Insulation within structural area	390	(20%)	0	(0%)	16	(19%)	$17	(16%)
Exterior wall covering or finish	190	(9%)	0	(0%)	0	(0%)	$19	(18%)
Unclassified structural component or finish	150	(8%)	0	(0%)	5	(6%)	$3	(3%)
Exterior roof covering or finish	120	(6%)	0	(0%)	5	(6%)	$8	(8%)
Flammable or combustible liquid or gas, piping, or filter	90	(5%)	5	(34%)	12	(14%)	$9	(9%)
Unclassified item first ignited	90	(4%)	0	(0%)	2	(3%)	$4	(3%)
Interior wall covering, excluding drapes	50	(2%)	0	(0%)	3	(4%)	$1	(1%)
Exterior trim, including doors	40	(2%)	0	(0%)	0	(0%)	$4	(4%)
Cooking materials, including food	40	(2%)	0	(0%)	4	(5%)	$1	(1%)
Multiple items first ignited	40	(2%)	0	(0%)	2	(3%)	$5	(4%)
Light vegetation, including grass	30	(2%)	0	(0%)	0	(0%)	$1	(1%)
Other known item	290	(15%)	5	(33%)	16	(19%)	$9	(9%)
Total	1,980	(100%)	16	(100%)	85	(100%)	$106	(100%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident types 113–118) were excluded from this analysis.

Source: NFIRS 5.0 and NFPA's fire experience survey.

Table 5B. Non-Home Structure Fires Caused by Hot Work by Item First Ignited: 2014–2018 Annual Averages

Item First Ignited	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Flammable or combustible liquid or gas, piping, or filter	430	(17%)	4	(78%)	37	(44%)	$83	(22%)
Exterior roof covering or finish	270	(10%)	0	(0%)	2	(3%)	$137	(36%)
Insulation within structural area	240	(9%)	0	(0%)	2	(3%)	$9	(2%)
Structural member or framing	210	(8%)	0	(0%)	1	(1%)	$8	(2%)
Dust, fiber, lint, including sawdust or excelsior	140	(5%)	0	(0%)	13	(16%)	$8	(2%)
Unclassified item first ignited	130	(5%)	0	(0%)	2	(2%)	$5	(1%)
Exterior wall covering or finish	120	(4%)	0	(0%)	0	(0%)	$2	(0%)
Unclassified structural component or finish	100	(4%)	0	(0%)	3	(3%)	$20	(5%)
Material being used to make a product	80	(3%)	0	(0%)	1	(1%)	$3	(1%)
Box, carton, bag, basket, or barrel	80	(3%)	0	(0%)	5	(6%)	$2	(0%)
Multiple items first ignited	70	(3%)	0	(0%)	0	(0%)	$7	(2%)
Interior wall covering, excluding drapes	70	(3%)	0	(0%)	2	(2%)	$50	(13%)
Light vegetation, including grass	60	(2%)	0	(0%)	1	(2%)	$2	(1%)
Rubbish, trash, or waste	50	(2%)	0	(0%)	1	(1%)	$3	(1%)
Interior ceiling cover or finish	50	(2%)	0	(0%)	1	(2%)	$9	(2%)
Electrical wire or cable insulation	50	(2%)	0	(0%)	0	(0%)	$5	(1%)
Unclassified organic material	40	(2%)	0	(0%)	0	(0%)	$10	(3%)
Other known item first ignited	420	(16%)	1	(22%)	12	(14%)	$16	(4%)
Total	2,600	(100%)	5	(100%)	86	(100%)	$378	(100%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident types 113–118) were excluded from this analysis.

Source: NFIRS 5.0 and NFPA's fire experience survey.

Table 6A. Home Structure Fires Caused by Hot Work by Factor Contributing to Ignition: 2014–2018 Annual Averages

Factor Contributing to Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Heat source too close to combustibles	940	(48%)	7	(40%)	29	(34%)	$45	(42%)
Cutting or welding too close to combustibles	540	(28%)	3	(20%)	27	(31%)	$30	(28%)
Equipment not being operated properly	120	(6%)	0	(0%)	7	(8%)	$4	(4%)
Unclassified misuse of material or product	80	(4%)	0	(0%)	3	(3%)	$3	(3%)
Equipment unattended	60	(3%)	3	(20%)	2	(2%)	$2	(2%)
Unclassified factor contributed to ignition	50	(2%)	0	(0%)	2	(2%)	$3	(3%)
Equipment used for unintended purpose	40	(2%)	0	(0%)	2	(2%)	$1	(1%)
Electrical failure or malfunction	40	(2%)	0	(0%)	0	(0%)	$1	(1%)
Unclassified operational deficiency	30	(2%)	0	(0%)	1	(1%)	$11	(11%)
Unintentionally turned on or not turned off	30	(2%)	3	(20%)	4	(5%)	$1	(1%)
Other known factor	180	(9%)	0	(0%)	23	(27%)	$14	(13%)
Total fires	1,980	(100%)	16	(100%)	85	(100%)	$106	(100%)
Total factors	2,120	(107%)	16	(100%)	99	(116%)	$114	(108%)

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," "undetermined," or not reported have been allocated proportionally among fires with known factors contributing to ignition. Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident type 113-118) were excluded from this analysis.

Source: NFIRS 5.0 and NFPA's fire experience survey.

Table 6B. Non-Home Structure Fires Caused by Hot Work by Factor Contributing to Ignition: 2014–2018 Annual Averages

Factor Contributing to Ignition	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Cutting or welding too close to combustibles	1,050	(40%)	5	(100%)	25	(29%)	$141	(37%)
Heat source too close to combustibles	650	(25%)	0	(0%)	22	(25%)	$43	(11%)
Mechanical failure or malfunction	210	(8%)	0	(0%)	9	(11%)	$17	(5%)
Electrical failure or malfunction	170	(7%)	0	(0%)	1	(1%)	$13	(3%)
Equipment not being operated properly	100	(4%)	0	(0%)	3	(3%)	$111	(29%)
Failure to clean	80	(3%)	0	(0%)	16	(18%)	$6	(2%)
Equipment unattended	80	(3%)	0	(0%)	2	(3%)	$2	(1%)
Unclassified factor contributed to ignition	60	(2%)	0	(0%)	4	(5%)	$3	(1%)
Unclassified operational deficiency	50	(2%)	0	(0%)	2	(2%)	$16	(4%)
Unclassified misuse of material or product	50	(2%)	0	(0%)	5	(6%)	$5	(1%)
Other known factor	260	(10%)	0	(0%)	4	(4%)	$32	(8%)
Total fires	2,600	(100%)	5	(100%)	86	(100%)	$378	(100%)
Total factors	2,770	(106%)	5	(100%)	92	(107%)	$389	(103%)

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 factors contributing to ignition. Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident types 113–118) were excluded from this analysis.

Source: NFIRS 5.0 and NFPA's fire experience survey.

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