RESEARCH

# Home Dryer Fires

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# Home Dryer Fires

In 2014-2018, local fire departments responded to an estimated average of 13,820 home[1] structure fires per year in which dryers were involved in the ignition. These fires caused an average of seven civilian deaths, 344 civilian injuries, and $233 million in direct property damage annually.

Dryers caused 4 percent of home structure fires, less than 1 percent of home fire deaths, and 3 percent of home fire deaths and direct fire property damage.

One-third (32 percent) of dryer fires were caused by a failure to clean. This appears to be mainly lint build-up, as 27 percent of dryer fires started when dust, fiber or lint ignited.

Mechanical failures or malfunctions caused 27% of dryer fires; 16% were caused by electrical failures or malfunctions.

Seventy-eight percent of the dryers involved in home fires were powered by electricity while 22% were powered by gas. This is generally consistent with usage. According to the American Housing Survey, 79% of household dryers in 2017 were powered by electricity and 21% by gas.[2]

Three tables are included in this analysis:

Table 1. Home Dryer Fires by Factor Contributing to Ignition
Table 2. Home Dryer Fires by Item First ignited
Table 3. Home Dryer Fires by Power Source

Estimates were derived from the US Fire Administration's National Fire Incident Reporting System (NFIRS) and the NFPA annual fire department experience survey and include proportional shares of unknown or missing data. Only fires reported to local fire departments are included. 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. See *How NFPA's National Estimates Are Calculated for Home Structure Fires* for details about the methodology used. Dryers were identified by NFIRS equipment involved in ignition code 811. Fires with Non-confined and confined NFIRS structure fire incident types were analyzed separately and summed.

[1] The term "home" encompasses one- and two-family homes, including manufactured housing, and apartments or other manufactured homes. This estimate includes 1,280 fires with confined structure fire incident types (NFIRS incident type codes 113-118, including confined: cooking fires, chimney or flue fires, fuel burner or boiler fires, incinerator fires, compactor fires, and trash fires in or on a structure that did not spread to other contents or the structure itself.. Causal information is not required for confined fires, although it is sometimes reported. By definition, these fires are minor.) Some NFPA analyses omit confined fires from estimates of fires that did not begin with cooking or heating equipment.

[2] American Housing Survey. Table Creator: "2017 National- Heating, Air Conditioning, and Appliances - All Occupied Units." Accessed at https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html April 14, 2020.

**Table 1.**
**Home Dryer Fires, by Factor Contributing to Ignition**
**2014–2018 Annual Averages**
**(Unknowns Were Allocated Proportionally)**

| Factor Contributing | Fires | | Civilian Deaths | | Civilian Injuries | | Direct Property Damage (in Millions) | |
|---|---|---|---|---|---|---|---|---|
| Failure to clean | 4,470 | (32%) | 7 | (100%) | 96 | (28%) | $44 | (19%) |
| Non-confined | 3,970 | (29%) | 7 | (100%) | 96 | (28%) | $44 | (19%) |
| Confined | 500 | (4%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Mechanical failure or malfunction* | 3,790 | (27%) | 0 | (0%) | 94 | (27%) | $60 | (26%) |
| Non-confined | 3,460 | (25%) | 0 | (0%) | 94 | (27%) | $60 | (26%) |
| Confined | 340 | (2%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Electrical failure or malfunction* | 2,270 | (16%) | 0 | (0%) | 46 | (13%) | $55 | (23%) |
| Non-confined | 2,150 | (16%) | 0 | (0%) | 46 | (13%) | $55 | (23%) |
| Confined | 120 | (1%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Heat source too close to combustibles | 770 | (6%) | 0 | (0%) | 18 | (5%) | $15 | (6%) |
| Non-confined | 700 | (5%) | 0 | (0%) | 18 | (5%) | $15 | (6%) |
| Confined | 70 | (1%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Equipment unattended | 470 | (3%) | 0 | (0%) | 7 | (2%) | $15 | (6%) |
| Non-confined | 450 | (3%) | 0 | (0%) | 7 | (2%) | $15 | (6%) |
| Confined | 20 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Unclassified operational deficiency | 440 | (3%) | 0 | (0%) | 12 | (4%) | $7 | (3%) |
| Non-confined | 390 | (3%) | 0 | (0%) | 12 | (4%) | $6 | (3%) |
| Confined | 50 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Equipment overloaded | 390 | (3%) | 0 | (0%) | 11 | (3%) | $3 | (1%) |
| Non-confined | 370 | (3%) | 0 | (0%) | 11 | (3%) | $3 | (1%) |
| Confined | 20 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Unclassified misuse of material or product | 380 | (3%) | 0 | (0%) | 23 | (7%) | $3 | (1%) |
| Non-confined | 310 | (2%) | 0 | (0%) | 23 | (7%) | $3 | (1%) |
| Confined | 80 | (1%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Unclassified factor contributed to ignition | 380 | (3%) | 0 | (0%) | 21 | (6%) | $11 | (5%) |
| Non-confined | 360 | (3%) | 0 | (0%) | 21 | (6%) | $11 | (5%) |
| Confined | 20 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |

*****Electrical failures or malfunctions and mechanical failures or malfunctions were summed from NFIRS factors contributing to ignition codes 30-37 and 20-27, respectively.

**Table 1. (Continued)**
**Home Dryer Fires, by Factor Contributing to Ignition**
**2014–2018 Annual Averages**
**(Unknowns Were Allocated Proportionally)**

| Factor Contributing | Fires | | Civilian Deaths | | Civilian Injuries | | Direct Property Damage (in Millions) | |
|---|---|---|---|---|---|---|---|---|
| Equipment not being operated properly | 320 | (2%) | 0 | (0%) | 20 | (6%) | $3 | (1%) |
| Non-confined | 290 | (2%) | 0 | (0%) | 20 | (6%) | $3 | (1%) |
| Confined | 30 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Installation deficiency | 280 | (2%) | 0 | (0%) | 9 | (3%) | $4 | (2%) |
| Non-confined | 260 | (2%) | 0 | (0%) | 9 | (3%) | $4 | (2%) |
| Confined | 30 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Other known factor contributing to ignition | 500 | (4%) | 0 | (0%) | 7 | (2%) | $27 | (12%) |
| Non-confined | 450 | (3%) | 0 | (0%) | 7 | (2%) | $27 | (11%) |
| Confined | 50 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| | | | | | | | | |
| Total fires | 13,820 | (100%) | 7 | (100%) | 344 | (100%) | $233 | (100%) |
| Non-confined fire | 12,540 | (91%) | 7 | (100%) | 344 | (100%) | $233 | (100%) |
| Confined fire | 1,280 | (9%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| | | | | | 0 | | | |
| Total factors | 14,480 | (105%) | 7 | (100%) | 365 | (106%) | $246 | (105%) |
| Non-confined fire | 13,150 | (95%) | 7 | (100%) | 365 | (106%) | $246 | (105%) |
| Confined fire | 1,330 | (10%) | 0 | (0%) | 0 | (0%) | $0 | (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 *How NFPA's National Estimates Are Calculated for Home Structure Fires* for details about the methodology used.

Source: NFIRS 5.0 and NFPA fire experience survey

**Table 2.**
**Home Dryer Fires, by Item First Ignited**
**2014–2018 Annual Averages**
**(Unknowns Were Allocated Proportionally)**

| Item First Ignited | Fires | | Civilian Deaths | | Civilian Injuries | | Direct Property Damage (in Millions) | |
|---|---|---|---|---|---|---|---|---|
| Dust, fiber, lint, including sawdust or excelsior | 3,680 | (27%) | 7 | (100%) | 71 | (21%) | $42 | (18%) |
| Non-confined | 3,260 | (24%) | 7 | (100%) | 71 | (21%) | $42 | (18%) |
| Confined | 420 | (3%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Clothing | 3,440 | (25%) | 0 | (0%) | 103 | (30%) | $53 | (23%) |
| Non-confined | 3,140 | (23%) | 0 | (0%) | 103 | (30%) | $53 | (23%) |
| Confined | 300 | (2%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Appliance housing or casing | 1,620 | (12%) | 0 | (0%) | 35 | (10%) | $26 | (11%) |
| Non-confined | 1,500 | (11%) | 0 | (0%) | 35 | (10%) | $26 | (11%) |
| Confined | 120 | (1%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Unclassified soft goods or wearing apparel | 1,470 | (11%) | 0 | (0%) | 55 | (16%) | $22 | (9%) |
| Non-confined | 1,340 | (10%) | 0 | (0%) | 55 | (16%) | $22 | (9%) |
| Confined | 140 | (1%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Electrical wire or cable insulation | 780 | (6%) | 0 | (0%) | 8 | (2%) | $11 | (5%) |
| Non-confined | 740 | (5%) | 0 | (0%) | 8 | (2%) | $11 | (5%) |
| Confined | 40 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Linen (other than bedding) | 680 | (5%) | 0 | (0%) | 19 | (5%) | $6 | (3%) |
| Non-confined | 590 | (4%) | 0 | (0%) | 19 | (5%) | $6 | (3%) |
| Confined | 80 | (1%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Mattress or bedding | 430 | (3%) | 0 | (0%) | 9 | (3%) | $5 | (2%) |
| Non-confined | 390 | (3%) | 0 | (0%) | 9 | (3%) | $5 | (2%) |
| Confined | 40 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Unclassified item first ignited | 390 | (3%) | 0 | (0%) | 8 | (2%) | $5 | (2%) |
| Non-confined | 360 | (3%) | 0 | (0%) | 8 | (2%) | $5 | (2%) |
| Confined | 30 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Flammable or combustible liquids or gases, piping or filter | 300 | (2%) | 0 | (0%) | 7 | (2%) | $9 | (4%) |
| Non-confined | 270 | (2%) | 0 | (0%) | 7 | (2%) | $9 | (4%) |
| Confined | 30 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Other known item first ignited | 1,040 | (7%) | 0 | (0%) | 28 | (8%) | $54 | (23%) |
| Non-confined | 960 | (7%) | 0 | (0%) | 28 | (8%) | $54 | (23%) |
| Confined | 70 | (1%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |

**Table 2. (Continued)**
**Home Dryer Fires, by Item First Ignited**
**2014–2018 Annual Averages**
**(Unknowns Were Allocated Proportionally)**

| Item First Ignited | Fires | | Civilian Deaths | | Civilian Injuries | | Direct Property Damage (in Millions) | |
|---|---|---|---|---|---|---|---|---|
| Total | 13,820 | (100%) | 7 | (100%) | 344 | (100%) | $233 | (100%) |
| Non-confined | 12,540 | (91%) | 7 | (100%) | 344 | (100%) | $233 | (100%) |
| Confined | 1,280 | (9%) | 0 | (0%) | 0 | (0%) | $0 | (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 *How NFPA's National Estimates Are Calculated for Home Structure Fires* for details about the methodology used.

Source: NFIRS 5.0 and NFPA fire experience survey

**Table 3.**
**Home Dryer Fires, by Power Source**
**2014–2018 Annual Averages**
**(Unknowns Were Allocated Proportionally)**

| Factor Contributing | Fires | | Civilian Deaths | | Civilian Injuries | | Direct Property Damage (in Millions) | |
|---|---|---|---|---|---|---|---|---|
| Electric | 10,740 | (78%) | 7 | (100%) | 264 | (77%) | $191 | (82%) |
| Non-confined | 9,810 | (71%) | 7 | (100%) | 264 | (77%) | $191 | (82%) |
| Confined | 930 | (7%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Gas | 3,060 | (22%) | 0 | (0%) | 80 | (23%) | $42 | (18%) |
| Non-confined | 2,720 | (20%) | 0 | (0%) | 80 | (23%) | $42 | (18%) |
| Confined | 350 | (3%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Other known power source | 10 | (0%) | 0 | (0%) | 0 | | | |
| Non-confined | 10 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| Confined | 0 | (0%) | 0 | (0%) | 0 | (0%) | $0 | (0%) |
| | | | | | | (0%) | $0 | (0%) |
| Total | 13,820 | (100%) | 7 | (100%) | 344 | | | |
| Non-confined | 12,540 | (91%) | 7 | (100%) | 344 | (100%) | $233 | (100%) |
| Confined | 1,280 | (9%) | 0 | (0%) | 0 | (100%) | $233 | (100%) |

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 *How NFPA's National Estimates Are Calculated for Home Structure Fires* for details about the methodology used.

Source: NFIRS 5.0 and NFPA fire experience survey