

HOME FIRES INVOLVING HEATING EQUIPMENT

John R. Hall, Jr.

November 2011



**National Fire Protection Association
Fire Analysis and Research Division**

Abstract

In 2009, heating equipment was involved in an estimated 58,900 reported home structure fires, 480 civilian deaths, 1,520 civilian injuries, and \$1.1 billion in direct property damage. Fires, injuries, and damages were all lower than in 2008 (and deaths were virtually unchanged) and fit into a largely level trend over the past few years, coming after a sharp decline from the early 1980s to the late 1990s.

In 2005-2009, most home heating fire deaths (79%) and injuries (66%) and half (52%) of associated direct property damage involved stationary or portable space heaters.

Space heating poses a much higher risk of fire, death, injury, and loss per million users than central heating.

Keywords: Heating, space heater, water heater, furnace, wood stove, heat tape, fireplace, creosote, chimney, fire statistics, home fires, residential 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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National Fire Protection Association
One-Stop Data Shop
1 Batterymarch Park
Quincy, MA 02169-7471
www.nfpa.org
e-mail: osds@nfpa.org
phone: 617-984-7443

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Executive Summary

In 2009, heating equipment was involved in an estimated 58,900 reported U.S. home structure fires, with associated losses of 480 civilian deaths, 1,520 civilian injuries, and \$1.1 billion in direct property damage. The estimated home heating fire total was down 11% from the previous year and 75% from 1980. Associated deaths were up 1% from 2008 but down 53% from 1980. Associated civilian injuries were down by 8% compared to 2008 and by 57% from 1980. Direct property damage adjusted for inflation was down by 3% from 2008 and by 47% from 1980. “Homes” refers to one- and two-family homes (which include manufactured homes) and apartments (which include townhouses).

Overall in 2009, these incidents accounted for 18% of all reported home fires (second highest after cooking), 22% of home fire deaths (second highest after smoking), 13% of home civilian injuries (second highest after cooking), and 12% of the direct property damage (highest share) resulting from home fires. These statistics are estimates derived from Version 5.0 of the U.S. Fire Administration’s National Fire Incident Reporting System and NFPA’s annual fire department experience survey.

Stationary (fixed) and portable space heaters, excluding fireplaces, chimneys, and chimney connectors, but including wood stoves, accounted for one-third (32%) of reported 2005-2009 U.S. home heating fires, four out of five (79%) associated civilian deaths, nearly two-thirds (66%) of associated civilian injuries, and half (52%) of associated direct property damage.

Creosote is a sticky, oily, combustible substance created when wood does not burn completely. It rises into the chimney as a liquid and deposits on the chimney wall. A conservative best estimate of creosote fires would combine failure-to-clean fires that were confined to chimney or flue or involved solid-fueled space heaters, fireplaces, chimneys and chimney connectors. This produces estimates of 14,190 reported creosote fires (22% of all home heating fires) per year with associated losses of four civilian deaths, 11 civilian injuries, and \$35 million in direct property damage per year.

The leading factors contributing to ignition in home heating equipment fires were failure to clean (26%), heat source too close to combustibles (14%), and unclassified mechanical failure or malfunction (12%). Heat source too close to combustibles accounted for (53%) of associated deaths.

The leading items first ignited for home heating equipment fires were unclassified item (16%), flammable or combustible gas or liquid (15%), structural member or framing (8%), unclassified organic material (6%), and wire or cable insulation (6%).

Space heaters result in far more fires and losses than central heating devices and have higher risks relative to usage.

Comparisons of different fuel or power options within central heating equipment do not show any specific type to be clearly and consistently better or worse for all types of loss.

- Among central heating equipment, liquid-fueled units show a higher rate of civilian fire deaths per user household. However, low usage of this equipment means that this rate is highly variable year-to-year. In 2003-2007, liquid-fueled equipment had the lowest rate.
- Liquid-fueled units also have the highest risk of fires and civilian injuries.
- Electric-powered units have the highest risk of direct property damage.

Among space heating equipment, risks are highest for liquid-fueled devices for all four measures of loss. However, usage of liquid-fueled space heaters is so low that the rates for such devices can and do vary substantially, even for five-year averages. Portable electric devices have higher risk than fixed electric devices.

Water heaters show very large differences with gas-fueled equipment showing higher rates per million population than electric-powered equipment for fires (68 vs. 60), civilian fire deaths (0.6 vs. 0.0), and civilian fire injuries (3.8 vs. 1.1), and a higher rate per person for direct property damage (\$1.7 vs. \$0.5).

Home heating fires peak in period from late afternoon to late evening. Home heating fires are less common during midnight to 6:00 a.m. This could reflect the practice in many homes of turning down the heat overnight, allowing blankets and bedding to compensate, and of relying less on heating equipment in the middle of the day, when temperatures are at their daily highs and occupants are least likely to be at home (during school and work hours). It also reflects the fact that sleeping occupants are not actively interacting with the equipment, which is how most fires begin.

Gas-fueled heating devices, particularly space heaters, pose a higher risk of death due to non-fire carbon monoxide poisoning, accounting for 59 of 68 deaths per year involving carbon monoxide poisoning by home heating equipment in 2003-2007. Heating equipment accounted for 61,930 injuries (not limited to fire or burn injuries) reported to hospital emergency rooms in 2010.

Safe Heating Behaviors

- All heaters need space. Keep things that can burn, such as paper, bedding or furniture, at least 3 feet away from heating equipment.
- Use heating equipment that has the label of a recognized testing laboratory.
- Install stationary space heating equipment, water heaters or central heating equipment according to the local codes and manufacturer's instruction. Have a qualified professional install the equipment.
- Make sure all fuel-burning equipment is vented to the outside to avoid carbon monoxide poisoning. CO is created when fuels burn incompletely. CO poisoning can cause illness and even death. Make sure the venting for exhaust is kept clear and unobstructed. This includes removal of snow around the outlet to the outside.
- Install and maintain carbon monoxide alarms inside your home to provide early warning of carbon monoxide.
- Maintain heating equipment and chimneys by having them cleaned and inspected annually by a qualified professional.

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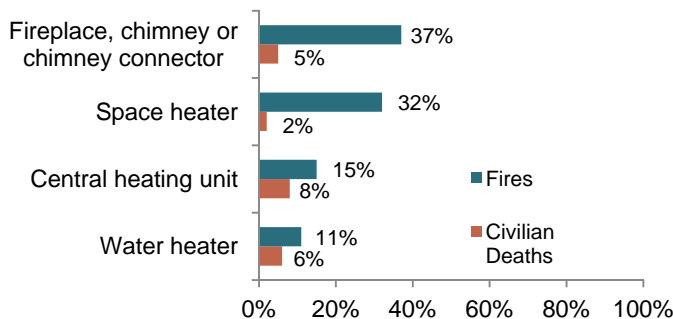


U.S. Home Heating Equipment Fires Fact Sheet

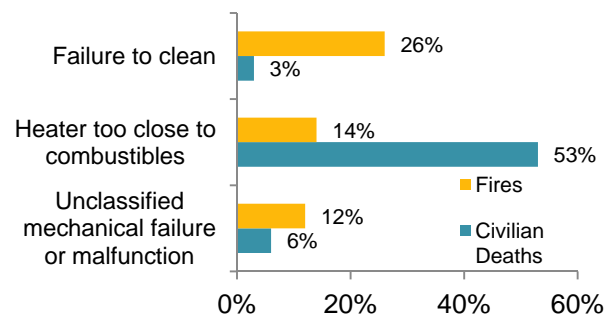
In 2009, U.S. fire departments responded to **58,900** home¹ structure fires that involved heating equipment. These fires caused

- 480 civilian fire deaths
 - 1,520 civilian fire injuries
 - \$1.1 billion in direct property damage
- Heating equipment fires accounted for 18% of all reported home fires in 2009 (second behind cooking) and 22% of home fire deaths.
 - In 2005-2009, the leading factor contributing to home heating fires (26%) was failure to clean, principally creosote from solid-fueled heating equipment, primarily chimneys.
 - The leading factor contributing to ignition for home heating fire deaths (53%) was heating equipment too close to things that can burn, such as upholstered furniture, clothing, mattress, or bedding.
 - Half (49%) of all home heating fires occurred in December, January and February in 2005-2009.
 - Home heating fires peak during 6:00 to 8:00 p.m., and associated deaths peak during 12:00 to 2:00 a.m.

U.S. Home Heating Fires by Equipment Involved: 2005-2009



Leading Factors in Home Heating Fires 2005-2009



- Creosote is estimated to be involved in 14,190 home heating fires per year, or 22% of total home heating fires in 2005-2009.
- Creosote fires are estimated to involve 4 civilian deaths, 11 civilian injuries, and \$35 million in direct property damage per year.

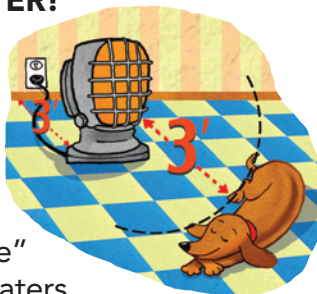
¹Homes are dwellings, duplexes, manufactured homes, apartments, townhouses, rowhouses and condominiums

Heating Safety

There is something about the winter months and curling up with a good book by the fireplace. But did you know that heating equipment is a leading cause of home fire deaths? With a few simple safety tips and precautions you can prevent most heating fires from happening.

BE WARM AND SAFE THIS WINTER!

- »»» Keep anything that can burn at least three-feet away from heating equipment, like the furnace, fireplace, wood stove, or portable space heater.
- »»» Have a three-foot "kid-free zone" around open fires and space heaters.
- »»» Never use your oven to heat your home.
- »»» Have a qualified professional install stationary space heating equipment, water heaters or central heating equipment according to the local codes and manufacturer's instructions.
- »»» Have heating equipment and chimneys cleaned and inspected every year by a qualified professional.
- »»» Remember to turn portable heaters off when leaving the room or going to bed.
- »»» Always use the right kind of fuel, specified by the manufacturer, for fuel burning space heaters.
- »»» Make sure the fireplace has a sturdy screen to stop sparks from flying into the room. Ashes should be cool before putting them in a metal container. Keep the container a safe distance away from your home.
- »»» Test smoke alarms monthly.



Heating Equipment Smarts

Install wood burning stoves following manufacturer's instructions or have a professional do the installation. All fuel-burning equipment should be vented to the outside to avoid carbon monoxide (CO) poisoning.

Install and maintain CO alarms to avoid the risk of CO poisoning. If you **smell** gas in your gas heater, do not light the appliance. Leave the home immediately and call your local fire department or gas company.



FACT

Half of home heating fires are reported during the months of **December, January, and February.**



Your Source for SAFETY Information

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