

HOME FIRES INVOLVING AIR CONDITIONING OR RELATED EQUIPMENT

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Abstract

In 2006, air conditioning or related equipment was involved in an estimated 7,400 reported home structure fires, 270 civilian injuries, and \$200 million in direct property damage. There were no civilian deaths in 2006, an atypical year, but there were an average of 32 civilian deaths per year in 2003-2006.

Keywords: Air conditioning, fan, heat pump, fire statistics, home fires, residential fires.

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Executive Summary

In 2006, air conditioning or related equipment was involved in an estimated 7,400 reported U.S. home structure fires, with associated losses of 270 civilian injuries and \$200 million in direct property damage. There were no reported civilian deaths in 2006, an atypical year, but there were 32 civilian deaths per year in 2003-2006. During the period of 2002-2006, there has been no clear trend up or down in the fires.

In 2003-2006, the 7,000 reported home structure fires per year involving air conditioning and related equipment included 2,400 per year involving central and room air conditioners specifically and 3,700 per year involving fans. Heat pumps accounted for 500 fires per year. No other specific type of equipment accounted for 300 or more fires per year. Air conditioners and fans also accounted for nearly all the associated losses.

Air conditioners and heat pumps have comparable numbers of fires relative to usage. In 2005, 82.4 million housing units had air conditioning without heat pumps, 53.5 million central and 28.9 million room air conditioners in one or more rooms. In 2005, heat pumps were used as central air conditioning equipment in 12.3 million households. This gives the two types of equipment similar rates of fires and loss relative to usage:

Comparative Fire Risk for Air Conditioning and Heat Pumps (2003-2006 Average Annual Non-Confined Fires vs. 2005 Usage)

Risk measure	Air conditioning	Heat pumps
Fires (per million user households)	29	28
Civilian deaths (per million user households)	0.2	0.0
Civilian injuries (per million user households)	1.2	0.9
Direct property damage (per user household)	\$0.76	\$0.36

Note: These are national estimates of non-confined fires reported to U.S. municipal departments and so exclude fires reported only to Federal or state agencies on industrial fire brigades. National estimates are projections. Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Figures reflect a proportional share of house fires with equipment involved in ignition unknown or reported as heating or air conditioning equipment of unknown type. Fires reported as “no equipment” but lacking a confirming specific heat source (codes 40-99) are also treated as unknown equipment and allocated.

Source: 2003-2006 data from NFIRS Version 5.0 and NFPA survey; 2005 air conditioning and heat pump usage data from heat pump usage data from 2005 *Residential Energy Consumption Survey* at <http://www.eia.doe.gov>, Table HC2.6.

In 2006, an estimated 33,500 injuries were reported to hospital emergency rooms as involving air conditioners, fans, humidifiers, dehumidifiers, air purifiers, and heat pumps. The leading types of injuries were laceration (14,890), contusion or abrasion (6,110), and strain or sprain (4,430).

In 1995-2003 (excluding 1999, which was not reported), there were 11.5 electrocution deaths per year involving air conditioners and 4.3 electrocution deaths per year involving fans.

The leading factors contributing to ignition for air conditioning or related equipment are mostly equipment-related codes without failure mode specifics. One-third of fires involving air conditioning or related equipment began with ignition of wire or cable insulation. The leading areas of origin for home fires involving air conditioning or related equipment are bathroom (21%) and bedroom (19%). The leading areas of origin for fire deaths are bedroom (47%) and living room, family room, or den (25%).

Air conditioners have a shorter season of usage than fans, based on fire incidence. If fires occurred evenly throughout the year, then every month would have 8.3% (1 in 12) of the fires. For all air conditioning or related equipment combined, the three peak months of June, July, and August account for 41% of the fires (compared to 25% if every block of three months had an equal share of fires). June, July and August accounted for 54% of air conditioner fires and 35% of fires involving fans. It is not surprising that fans have a longer season, because the category of fans includes fans used to help cooling (e.g., portable fans, attic fans) but also fans used year-round for ventilation (e.g., kitchen fans, bathroom fans).

Safe Use of Air Conditioning, Fans and Related Home Cooling Equipment

- Select and install cooling equipment for safety and effectiveness.
- Use electric-powered equipment safely, in accordance with manufacturer's instructions.
- Inspect and maintain electric-powered equipment regularly for safety.
- Make sure your equipment has the label showing that it is listed by a recognized testing laboratory.

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