
Smoke Alarm Fact Sheet

Ontario Statistics (1995 to 1997)

- **Fewer people die in home fires when a smoke alarm/detector is present and activates:**

- Smoke Alarm Present and Activated: 12 deaths/1000 home fires

- No Device / Alarm Did Not Activate: 17 deaths/1000 home fires

- **In some cases, people die in fires even though the smoke alarm activated. Here are the explanations:**

- 13% - suicides/homicides

- 21% - clothing fires

- 26% - device not in area of origin

- 20% - victim is physically challenged

- 16% - alcohol a factor

- 1% - victim re-enters fire scene

- 1% - unattended infant

- 2% - unknown

- **In some fires where people died, smoke alarms were present but did not activate. In 85% of the cases where the smoke alarm did not activate, it was due to a dead or missing battery/power source.**

- **The leading fire death scenarios continue to be the following:**
 - Home fire caused by smoking materials that ignite upholstered furniture in a living area at night.

- Home fire caused by smoking materials that ignite bedding in a sleeping area at night.
- Home fire caused by cooking equipment that is left unattended in the kitchen at night.

In these scenarios, a working smoke alarm can make a difference between life and death.

Studies Supporting Smoke Alarm Usage

- Canada Safety Council, 1996 Angus Reid "Smoke Alarm" Study

"88% of Canadians believe that smoke alarms are important to life safety"

- NFPA, "U.S. Experience With Smoke Detectors and other Fire Detectors", Aug. 96

"Homes with detectors have a 40 - 50% lower death rate"

- CMHC, "The Costs and Benefits of Smoke Alarms in Canadian Houses", Mar. 90

"Smoke alarms are saving lives and present a great life-saving and cost-saving opportunity"

- Ontario Housing Corporation, "LHA Fire Statistics for 1990"

"36 lives saved in 1990"

- The National Housing and Town Planning Council 1990, "Cause for Alarm - Smoke Alarms in the Home" (British Study)

Concludes that "300 lives could be saved and 4500 injuries could be avoided per year" and recommends the nationwide introduction of smoke alarms in the home

- OFM, "A Review Regarding Opportunities for Legislating Smoke Alarms in Ontario"

*Literature search of studies supporting the effectiveness of smoke alarms
Coroner's Jury Recommendations supporting smoke alarms
OAFCA and OMFPOA resolutions supporting mandatory smoke alarms*

Stories to support the effectiveness of smoke alarms:

1991 Fire Safety Action Award winner (New Liskeard)

Fourteen year old Sophie Brisson of New Liskeard alerted the fire department when she heard a smoke alarm going off in one of the homes along her paper route, preventing a very serious fire.

1994 Fire Safety Action Award winner (Garson)

Blane Gervais age 6 of Garson, Ontario, was awakened by a smoke alarm at 4:25 a.m. He then took his brother and crawled downstairs through a smoke-filled room to awaken his parents, who were sleeping in the basement. His school had taught him the proper response to fire emergencies.

1995 Fire Safety Action Award winner (Owen Sound)

Danny Sandbrook O'Conner age six of Owen Sound who bought his baby-sitter a smoke detector and pestered her until she installed it in her home. The smoke alarm later alerted the woman and her husband and allowed them to escape a fire that destroyed their home. Danny had been taught about the importance of smoke alarms in school as part of the LNTB program.

1998 Fire Safety Action Award winner (Haileybury)

Daisy Denomme, 12-year old from Haileybury was babysitting her two young brothers last July when the fire alarm activated. Daisy immediately got her brothers out of the building through a rear exit, then went to a neighbour's home to ask them to call the fire department.

1999 Fire Safety Action Award winners (Arthur)

Fifteen-year old Cynthia Dobben and her 13-year old sister Teri, of Arthur, Ontario have been credited with saving their family's lives during an early morning fire last April. The drama began when the smoke alarm in their farmhouse sounded just before 8 a.m. With the stairwell full of smoke and the family trapped upstairs, quick-thinking Cynthia climbed out of the window, onto a porch roof and down a tree. She then retrieved a ladder from the garage so her family could escape to safety. This was part of their planned and practised home escape plan. Fortunately, Teri had participated in The Great Escape program at her school a few months earlier and had insisted that her family develop and practice a fire escape plan. Although the family lost everything they owned in the fire, the result might have been far more tragic had it not been for the sisters' foresight and action.

1999 Fire Safety Action Award winner (Plattsville)

Nine-year old Jordan Earl, of Plattsville, Ontario, was awakened by the sound of the smoke alarm in his family's Plattsville home. A pot had caught fire on the stove causing thick, dense smoke to spread throughout the house. Jordan immediately got his three-year old sister, Jocelynn, and took her to a pre-arranged meeting place. After learning about home escape planning during a visit to his school by the Blanford-Blenheim Fire Department, Jordan insisted that his family develop and practice their own plan. Thanks to his persistence and his quick actions during the fire, Jordan ensured his sister's safety and his family managed to escape from the burning house.

Family Makes Great Escape (Pickering)

A smoke alarm and a mother's heroic actions are credited with saving a family of five from a fierce townhouse blaze yesterday. The fire started when heat from a burning candle melted the holder and hot wax seeped into a TV as the family slept. The mother and four children escaped the two-storey townhouse without injury.

"If it wasn't for the smoke alarm, we wouldn't have a life," the mother said. "At one time, I didn't think smoke alarms were such a big deal, but lately I've concentrated on keeping it in order," she said. "Thank God, it worked."

SMOKE ALARMS:

Questions and Answers

1. What is a smoke alarm?

A smoke alarm is a battery operated or electrically connected device that senses the presence of visible or invisible particles produced by combustion and that is designed to sound an alarm within the room or suite within which it is located.

2. Are smoke alarms effective?

The largest percentage of fire deaths in the home occurs at night while people are asleep. Therefore, a working smoke alarm can provide an early warning that can make the difference between life and death. According to studies published by the National Fire Protection Association, having a smoke alarm cuts your risk of dying in a fire by nearly half. However, a smoke alarm should be part of an overall home fire safety strategy that also includes preventing fires by adopting fire safe behaviour, and developing and practicing a home fire escape plan. In a fire, escape time may be very limited. Therefore, escape plans are a critical aspect of a home fire safety strategy. For additional information on the effectiveness of smoke alarms, refer to the Smoke Alarm Fact sheet.

3. What is the principal reason for smoke alarms not functioning?

Over a recent three year period, an analysis was undertaken of people that died in homes where smoke alarms were present but did not work. 85% of those victims did not have a functioning smoke alarm because of a dead or missing battery/power source.

4. What types of smoke alarms are available on the market?

There are two types of household smoke alarms in common use. These are known as ionization or photoelectric type smoke alarms.

5. How does an ionization type smoke alarm work?

This type of alarm uses a small amount of radioactive material to ionize air in the sensing chamber. As a result, the air chamber becomes conductive permitting current to flow between two charged electrodes. When smoke particles enter the chamber, the conductivity of the chamber air decreases. When this reduction in conductivity is reduced to a predetermined level, the alarm is set off. Most smoke alarms in use are of this type.

6. How does a photoelectric type smoke alarm work?

A photoelectric type smoke alarm consists of a light emitting diode and a light sensitive sensor in the sensing chamber. The presence of suspended smoke particles in the chamber scatters the light beam. This scattered light is detected and sets off the alarm.

7. Which type of alarm is more effective?

There is no simple answer to this question. The two types operate on different principles and therefore may respond differently to various conditions. Some advantages to each type are set out below:

Ionization

- Fastest type to respond to flaming fires
- Lowest cost and most commonly sold
- Some models have a hush or temporary silence feature that allows silencing without removing the battery
- Some models are available with a long life battery

Photoelectric

- Fastest type to respond to slow smoldering fires and white or gray smoke
- Less prone to nuisance alarms from cooking

Notwithstanding these differences, to achieve ULC listing, both alarms must be tested to the same standard and meet the same requirements. Photoelectric smoke alarms may respond slightly faster to smoldering fires, while ionization alarms respond slightly faster to flaming fires. Since you can't predict the type of fire that will occur, it is difficult to recommend which is best. Both alarms will detect all types of fires that commonly occur in the home. Installing both types of smoke alarms in your home can enhance fire safety.

8. Which type of smoke alarm should a homeowner purchase?

It is the consumer's responsibility to assess the circumstances of their household and to select the most appropriate alarm. However, an important consideration in the purchase of a smoke alarm is conformance to a recognized standard. In Ontario, CAN/ULC-S531 is the recognized standard for both the ionization and photoelectric types of alarms. Both ionization and photoelectric type products conforming to this standard are available on the market. A homeowner will know that a smoke alarm meets the requirements of this standard by the ULC or cUL label on the device.

9. What maintenance is required for smoke alarms?

The Ontario Fire Code requires that smoke alarms be maintained in operating condition at all times. Smoke alarms should be maintained in accordance with the manufacturer's instructions. Occasional light vacuuming will keep the air vents clean. On battery powered units, check to see that the battery is in place, connected, not corroded and functioning. Although the test frequency is not prescribed in the Ontario Fire Code, smoke alarms should be tested on a regular basis. Some manufacturers and authorities recommend that smoke alarms be tested at least once a month. Additional information on smoke alarm maintenance, particularly in rental accommodation, is available in the OFM guideline "Maintenance of Smoke Alarms."

10. How many smoke alarms should I have in my home?

The Ontario Fire Code requires a smoke alarm that meets CAN/ULC-S531 between each sleeping area and the remainder of the building. The Office of the Fire Marshal recommends that homeowners install one smoke alarm on every level of their home and outside all sleeping areas. For maximum protection, we suggest installing a smoke alarm in every room.

11. How should they be installed?

Smoke alarms should be installed according to the manufacturer's instructions.

12. What are the features I can expect to find on a current smoke alarm model?

These are some features you can expect to find:

- o a "missing battery" indicator,
- o an optional alarm hush or silence feature,
- o the use of a power "on" indicator light to show that ac power is being supplied to 120 volt wired in smoke alarms.

13. Studies suggest that a significant percentage of smoke alarms in use do not work because of dead or missing batteries. What is being done about this problem?

The OFM and the Ontario fire service have been stressing the importance of smoke alarm maintenance through various public education initiatives. This effort is now backed by requirements in the Ontario Fire Code which mandate smoke alarm maintenance. The Standard for Smoke Alarms has also been amended and now requires smoke alarms to have a visual indicator to flag a missing battery, for example, the inability to close the smoke alarm cover when a battery is removed. Nuisance alarms are a frequent reason for removing batteries. As a result, the use of smoke alarms with a hush or silence feature is being promoted in public safety programs. In addition, smoke alarms with long life batteries are now available on the market.

14. What are long life smoke alarms?

Long life smoke alarms have been designed to use lithium batteries where the battery life is predicted to last 10 years with the normal low battery drain of ionization type smoke alarms. The smoke alarms are still designed to provide a low battery audible signal as the battery charge is reduced to a level that may make the smoke alarm inoperable. It should be noted that although these batteries are designed to last 10 years, ongoing testing and maintenance is required as per manufacturers' instructions.

15. Can long life lithium batteries be used in any smoke alarm?

No. Only battery types recommended by the manufacturer should be used in a smoke alarm. Incorrect batteries may not provide the operating characteristics expected of the smoke alarm.

16. How often should a smoke alarm be replaced?

As a rule of thumb, the Office of the Fire Marshal recommends replacing smoke alarms every 10 years or when it has exceeded the manufacturer's recommended life cycle. Additional information for recommended smoke alarm replacement is available in the OFM guideline "Maintenance of Smoke Alarms."

17. How can I be sure that my smoke alarms will work?

We have every reason to believe that alarms listed by a certification agency accredited by the Standards Council of Canada will function as intended.

To ensure that an alarm has been manufactured and tested to an acceptable standard, there should be a marking by the Underwriters Laboratories of Canada (ULC), or Underwriters Laboratories Incorporated (UL).