This news bulletin has been prepared in response to concerns about the reliability of smoke alarms.

Fire safety in the home involves three things:

1. ***Prevention*** of unwanted fires.
2. An ***early warning system***, to alert occupants of smoke and fire danger, using smoke alarms.
3. ***Proper response*** to fire emergencies based on pre-planned and rehearsed fire escape plans.

It must be remembered that smoke alarms cannot prevent fires or the resulting injuries and deaths. They are simply early warning devices, which should be part of an overall home fire safety strategy that also includes preventing unwanted fires and developing and practicing a home fire escape plan. In a fire, the time available to escape may be very limited. Also, most fatal fires happen at night, when people are sleeping. Therefore, a working smoke alarm can provide an early warning that can make the difference between life and death. However, occupants in a home must know how to respond when the smoke alarm sounds. This is why preplanning and rehearsing a fire escape plan is vital.

Smoke Alarm Facts

- Smoke alarms are devices, powered by battery or household current, that automatically sound a warning alarm when they sense the presence of visible or invisible smoke particles produced by combustion.
- There are two types of smoke alarms on the market--ionization and photoelectric.

These two types of smoke alarms operate on different principles and therefore may respond differently to various fire situations. Testing results show both types of smoke alarms, if properly installed and maintained, will detect a fire in time to allow people to escape. Some of these differences between ionization and photoelectric smoke alarms are listed below:

Ionization type smoke alarms

Ionization type smoke alarms use 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 the conductivity is reduced to a predetermined level, the alarm is set off.

- Fastest type to respond to flaming fires (where flames are visible). According to the National Fire Protection Association (NFPA), 70 percent of home fires are of the fast-flaming type. The Underwriters' Laboratories of Canada, the smoke alarm testing and certification agency, states that ionization alarms are often recognized for being better suited in detecting fast-flaming fires.
- Lowest cost and most commonly sold.
- Test buttons allow periodic testing.
- Some models have a hush or temporary silence feature that allows silencing without removing the battery.
- Power source may be a battery or household current.
- Some models are available with a long life battery.

Photoelectric type smoke alarms

A photoelectric type smoke alarm consists of a light emitting diode and a light sensitive sensor in the sensing chamber. In one design the presence of suspended smoke particles in the chamber scatters the light beam. This scattered light is detected and sets off the alarm. A similar design relies on obscuration of light between the source and sensor to activate the alarm. Fastest type to respond to slow smouldering fires (such as those caused by a burning cigarette in a sofa or a smouldering rug). According to the National Fire Protection Association (NFPA), 30 percent of home fires are of the

smouldering type. The Underwriters' Laboratories of Canada states that photoelectric alarms are recognized for being better suited in detecting smouldering fires.

- Less prone to nuisance alarms from cooking.
- Test buttons allow periodic testing.

Installation, testing and maintenance of smoke alarms

1. It is the consumer's responsibility to assess the circumstances of their household and to select the most appropriate type of alarm. Since it is difficult to predict what type of fire (fast flaming or slow smouldering) will occur, it is difficult to recommend which type of smoke alarm is best. A reasonable approach is a combination of both types of smoke alarms, installed where each is needed most. A combination of both ionization and photoelectric type smoke alarms appear to give the best protection for all types of fires.
2. Purchase smoke alarms with marking by the Underwriters' Laboratories of Canada (ULC), or Underwriters Laboratories Incorporated ($_C$UL) to ensure that an alarm has been manufactured and tested to an acceptable standard.
3. The 1997 Ontario Fire Code requires **ALL** dwellings in the province to have smoke alarms. Dwellings are defined as usually containing cooking, eating, living, sleeping, and sanitary facilities.
4. Install at least one smoke alarm on each level of your home according to manufacturer's recommendations. There should be at least one alarm on every level of your home, with the most essential location being on the hallway ceiling near bedrooms.
5. Additional smoke alarms may be added in bedrooms or other locations to further reduce risk. Interconnection of smoke alarms, so all sound if any one alarm is activated, adds to their effectiveness.
6. Once installed, smoke alarms must be tested and maintained according to manufacturer's recommendations to ensure they are in working condition:

The Fire Commissioner's Office recommends the following test and maintenance procedures in addition to manufacturer's recommendations.

Test

- Test your smoke alarms at least monthly with smoke or in accordance with the manufacturers instructions.
- Drift smoke into the alarm from a just extinguished candle.
- Alarm should sound within 20 seconds.
- Fan smoke away to silence alarm.

If alarm does not sound:

Possible Causes	Action
• Battery dead • No electricity • Smoke alarm dead	• Replace battery immediately • Check fuse box/breaker panel or refer to electrician • Replace immediately

Maintenance

- Clean smoke alarms twice a year. Remove and wipe cover with a damp cloth. Gently vacuum the inside of the alarm.
- Replace batteries once a year or as needed (a chirping sound indicates low battery status).
- Never remove batteries for other uses.
- Do not install rechargeable batteries in smoke alarms.
- Replace smoke alarms 10 years or older with a new unit.

If the public is concerned about the ability of their smoke alarms (most units sold in the market would be the ionization type) to provide early warning of fire and smoke danger, testing should be done to ensure the alarms are in working condition. For added protection, photoelectric-type smoke alarms may be installed in addition to the existing ionization units.

Trent Hills Fire Department