**Fact Sheet**

Maximizing Your Safety with Smoke Alarms

For many years now, fire departments have educated the public on the importance of working smoke alarms in their homes. However, with the number of devices on the market and the technology available, it can be confusing to know which one to choose. Here are some helpful facts to consider when buying, installing and maintaining your smoke alarms.

Technology

With terms like photoelectric, ionization and interconnected, it is no wonder that homeowners are confused when it comes to which alarms they should choose. What does it mean?

A photoelectric alarm use light beams to trigger the alarm. Inside the smoke alarm there is a light and a sensor, but they are positioned at 90-degree angles to one another, like this: (here is a graphic from How Stuff Works to help)

Ⓐ Light source
Ⓑ Photo-detector
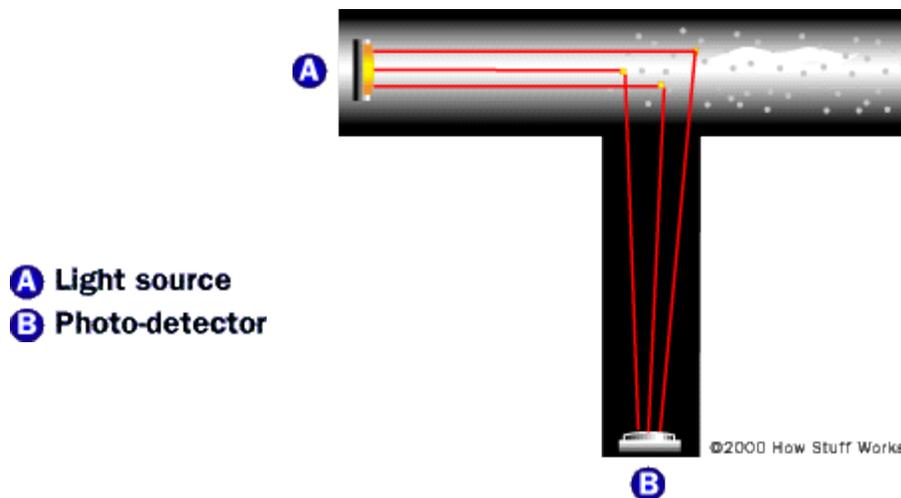
In the normal case, the light from the light source on the left shoots straight across and misses the sensor. When smoke enters the chamber, however, the smoke particles interrupt the light beam and scatter the light causing some beams to hit the sensor. The sensor then sets off the alarm in the smoke detector. Photoelectric detectors are better at sensing smoky <u>fires</u>, such as a smoldering mattress.

An ionization alarm uses an ionization chamber and a source of ionizing radiation to detect smoke. This type of smoke detector is common because it is inexpensive and better at detecting the smaller amounts of smoke produced by the flames of a fast moving fire.

An ionization chamber is very simple. It consists of two plates with a voltage across them, along with a radioactive source of ionizing radiation, like this: (again, thank you to How Stuff Works for the graphic)

Americium-241

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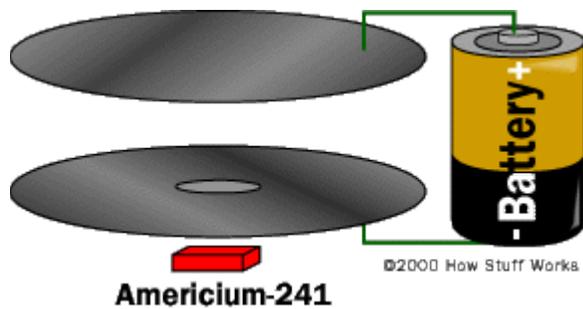
When smoke enters the ionization chamber, it disrupts this current -- the smoke particles attach to the ions and neutralize them. The smoke detector senses the drop in current between the plates and sets off the horn.

Speaking of alarms, whenever the words "nuclear radiation" are used an alarm goes off in many people's minds. The amount of radiation in a smoke detector is extremely small. It is also predominantly **alpha radiation**. Alpha radiation cannot penetrate a sheet of paper, and it is blocked by several centimeters of air. The americium in the smoke detector could only pose a danger if you were to inhale it. Therefore, you do not want to be playing with the americium in a smoke detector, poking at it, or disturbing it in any way, because you don't want it to become airborne.

Interconnected alarms are units that are wired together so that if one alarm is triggered, all of the alarms go off. This is an important feature to have in your alarms, especially during the hours when your family is asleep. These alarms can be photoelectric, ionization or a combination of both and have a battery backup in the event that power is lost.

The use of both photoelectric and ionization technologies optimizes detection, and could offer the best available escape time in residential fire situations.

- Ionization smoke alarms are best suited for alerting home occupants of fires originating from a flaming source - such as a lit candle igniting a towel.
- Photoelectric smoke alarms are most effective at sounding when fires originate from a smoldering source - such as a lit cigarette falling into a couch cushion.
- Dual-technology alarms combine the science of ionization and photoelectric sensors into a single unit.
- Interconnected smoke alarms, with units in several areas of the home, will help alert occupants in all areas of a home simultaneously, regardless of where the smoke starts.

Installation

The National Fire Protection Association and UL recommend the following tips when installing your smoke alarms:

- Install smoke alarms on every level of your home, including the basement, making sure that there is an alarm outside every separate sleeping area. New homes are required to have a smoke alarm in every sleeping room and all smoke alarms must be interconnected.
- Hard-wired smoke alarms should be installed by a qualified electrician and have battery backups in case of a power outage.
- If you sleep with bedroom doors closed, have a qualified electrician install interconnected smoke alarms in each room so that when one alarm sounds, they all sound.
- If you or someone in your home is deaf or hard of hearing, consider installing an alarm that combines flashing lights, vibration and/or sound.
- Mount smoke alarms high on walls or ceilings (remember, smoke rises). Ceiling mounted alarms should be installed at least four inches away from the nearest wall; wall-mounted alarms should be installed four to 12 inches away from the ceiling.
- If you have ceilings that are pitched, install the alarm near the ceiling's highest point.
- Don't install smoke alarms near windows, doors, or ducts where drafts might interfere with their operation.

Maintenance

- Test smoke alarms at least once a month.
- Dust smoke alarm vents regularly to prevent particles from blocking sensors.
- Never disconnect a smoke alarm or remove the batteries for any reason, except to change them.
- If a smoke alarm starts chirping, replace the batteries.
- Replace the batteries in your smoke alarm once a year, or as soon as the alarm "chirps," warning that the battery is low.

  Tip: Schedule battery replacements for the same day you change your clocks from Daylight Savings Time to Standard Time in the fall.
- Smoke alarm technology is constantly improving. Replace smoke alarms every 10 years, or as the manufacturer recommends - even if you've never had a house fire.

Other important considerations

- Some individuals, particularly children, the elderly, and those hard of hearing or with special needs, may not wake up to the sound of a smoke alarm. Be sure your home fire escape plan considers their needs.
- Develop a home fire escape plan. Today, people have only about three to four minutes to escape a residential fire. Early planning - and practice - helps ensure family members know exactly what to do if you have a home fire.
- Look for the UL Mark when purchasing a smoke alarm. The symbol indicates representative samples have been tested to show that the alarms meet UL's stringent safety standards.