

**2015 International Property Maintenance Code  
(Effective October 1, 2016)**

**[F] 704.2.1.3 Installation near cooking appliances.** Smoke alarms shall not be installed in the following locations unless this should prevent placement of a smoke alarm in a location required by Section 704.2.1.1 or 704.2.1.2.

1. Ionization smoke alarms shall not be installed less than 20 feet (6096 m) horizontally from a permanently installed cooking appliance.
2. Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.
3. Photoelectric smoke alarms shall not be installed less than 6 feet (1829mm) horizontally from a permanently installed cooking appliance.

**[F] 704.2.1.4 Installation near bathrooms.** Smoke alarms shall be installed not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by Section 704.2.1.1 or 704.2.1.2.

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**(Related Article)**

**Best Smoke Detector: Ionization, Photoelectric Or Dual Sensor?**

**Posted by: Kimberly Kurimski Updated: May 12, 2016 in Home Security 15**

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The U.S. Fire Administration (USFA) reported 1,448 residential fire fatalities between January 1 and July 31, 2013. The USFA gleans this information solely from U.S. news media reports, and estimates this number is about one third to one half of the actual residential fire fatalities occurring each year. We recently published an article titled [Fire Safety Tips](#) on how to prevent fires and stay safe around fire hazards. While we all try to do what we can to prevent residential fires, the easiest, most effective action we can take is to install smoke detectors in every room of our home.

A properly installed and maintained smoke detector is on alert 24 hours a day – whether you are awake or asleep – scanning for fire or smoke. The best smoke detectors are reliable, durable, and easy to test and maintain.

## Types of Smoke Detectors

The two primary types of residential smoke detectors contain either ionization or photoelectric sensors. Each type of smoke alarm detects distinctly different types of fires, so dual sensor alarms, which utilize both types of sensors, have risen in popularity.

Smoke detectors consist of two basic parts: a sensor to sense smoke and a loud electronic alarm. They can run off of a 9-volt battery or be hardwired into a 120-volt house current. The batteries, or backup batteries in a hardwired system, should be tested on a regular basis and replaced at least once each year.

Additionally, some smoke alarms are designed to meet the needs of people with hearing disabilities. These alarms use strobe lights and vibrations to alert anyone unable to hear standard smoke detectors.

- **Ionization**
- **Photoelectric**
- **Dual Sensor**

### Ionization

Ionization smoke detectors contain a very small amount of americium-241 within an ionization chamber. They create an electric current between two metal plates, which sound an alarm when disrupted by smoke entering the chamber. Ionization smoke alarms can quickly detect the small amounts of smoke produced by fast flaming fires, such as cooking fires or fires fueled by paper or flammable liquids.

This type of smoke detector, which is commonly used in kitchens, is prone to nuisance tripping. For example, we've all experienced the loud annoying chirping when we leave a cake in the oven too long or add oil to an extremely hot pan. When this happens, people are more prone to disable the alarms.

### Photoelectric

Photoelectric smoke detectors contain a light source in a light-sensitive electric sensor, which are positioned at 90-degree angles to one another. Normally, light from the light source shoots straight across and misses the sensor. When smoke enters the chamber, it scatters the light, which then hits the sensor and triggers the alarm.

Photoelectric smoke detectors typically respond faster to a fire in its early, smoldering stage – before the source of the fire bursts into flames. These detectors are more sensitive to the large combustion particles that emanate during slow, smoldering fires, which usually occur at night when people are asleep.

## **Dual Sensor**

**Dual sensor smoke detectors include both ionization and photoelectric sensors, so they should adequately alert homeowners of a smoldering fire or a fire with active flames. Some safety organizations have previously recommended these smoke alarms, because they should cover a broad range of fires.**

**However, there are no industry standards for setting the individual sensor sensitivity in dual sensor alarms. This means that a dual sensor alarm could have a non-functional ionization sensor, but as long as the photoelectric sensor works, it still meets the national standards developed by Underwriters Laboratories (UL).**

## **What Type Do You Have?**

**Most residences have smoke detectors installed before their inhabitants move in. To find out whether you have ionization, photoelectric, or dual sensor alarms, take the smoke alarm down from the ceiling or wall and inspect the back.**

**As mentioned previously, ionization smoke alarms all contain a trace amount of the radioactive material americium-241. Every ionization alarm has a warning about this material on the back label. In addition, it may have the words “ionization alarm” somewhere on the label. Photoelectric smoke detectors have the word “photoelectric” or a capital letter P printed or embossed on either the front or back. Dual sensor alarms have similar indications on their labels.**

## **Best Smoke Detector: Which One Should You Buy?**

**The International Association of Fire Fighters (IAFF) – the largest firefighters union in the U.S. and Canada – recommends photoelectric smoke detectors. During their 2008 conference, the IAFF adopted an official position recommending only photoelectric smoke alarms and stated that dual sensor alarms are no longer acceptable.**

**The technology used in ionization smoke detectors leads to a delayed warning in smoldering fires, which can lead to greater loss of life. Ionization detectors are also weaker in high airflow environments, so the delay may be even longer. Photoelectric smoke alarms are more effective at warning of smoke from smoldering fires and are less susceptible to nuisance alarms.**

**To be safe, the IAFF and other safety organizations recommend homeowners replace all ionization, dual sensor, and unknown alarms with photoelectric smoke alarms.**

## **What to Know Before You Buy**

**Functional smoke detectors continuously scan the air for smoke and can significantly increase your chances of surviving otherwise deadly residential fire. It can also help save the lives of firefighters who would otherwise have to risk their lives by searching a burning home for residents.**

**Look for the following features when purchasing a new smoke detector:**

- **Easy installation – Many battery operated detectors are easier to install than hardwired systems**
- **Testing – This ensures the smoke alarm is functioning properly**
- **Battery backup – Units function with or without electrical power**
- **Silence or Hush feature – Silence button enables you to quickly deactivate the alarm**
- **Warranty – The best smoke alarms have 5-10 year warranties**
- **Package deals – Many retailers offer packages with 4-6 smoke detectors**
- **Interconnected units – These alarms connect to each other within a home to provide residence-wide alerts**

**In addition, keep these tips in mind:**

- **State or municipality regulations – Check with your local and state authorities to learn about any specific requirements**
- **Carbon monoxide detectors – These might be necessary depending on your home's heating source**
- **Existing smoke detectors – Hardwired and battery operated detectors should be replaced with the same types**
- **Replace all smoke detectors at the same time – Especially if you don't know the age of your current detectors**

**According to recent data, almost two-thirds of residential fire casualties occurred in homes without properly functioning smoke alarms. Any smoke alarm that is 10 years old or older should be replaced regardless of type. If you moved into a pre-owned home and do not know the age of the existing smoke alarm, you should replace them immediately.**