

## **Smoke Detector University**

**Most people are aware of the danger of fire but are unaware of the fatality of smoke. More people die from breathing smoke than by burns. In fact, deaths from smoke inhalation outnumber deaths by burning by 2:1. In a hostile fire, smoke and deadly gases tend to spread farther and faster than heat from flames. Moreover, when people are asleep, deadly fumes can send them deeper into unconsciousness.**

**Smoke detectors and smoke detectors are a powerful and effective fire safety technology. They are the first lines of defense against smoke and fire. They may awaken those who would otherwise have been overcome by smoke and toxic gases in their sleep. And most importantly, they provide an early warning alerting individuals of a fire, allowing them precious time to escape.**

**According to the National Fire Protection Association (NFPA), 75 to 80% of all deaths by fire happen in the home. More than half of these deaths occurred in buildings without smoke detectors. By installing a smoke detector, individuals can reduce the risk of dying by almost 50%.**

**Ionization smoke detectors monitor 'ions,' or electrically charged particles in the air. Air molecules in a sample chamber of ionization smoke detectors, are 'ionized' by a radioactive source. This allows a small electrical current flow. Smoke particles entering the sensing chamber change the electrical balance of the air. The greater the amount of smoke, the higher the electrical imbalance. When combustion particles enter the smoke detector, they obstruct the flow of the current. An alarm is pre-programmed to sound when the current gets too low.**

**Ionization smoke detectors respond first to fast flaming fires. A flaming fire devours combustibles extremely fast, spreads rapidly and generates considerable heat with little smoke.**

**Ionization alarms are best suited for rooms, which contain highly combustible material. These types of material include:**

**1. Cooking fat/grease 2. Flammable liquids 3. Newspaper 4. Paint 5. Cleaning solutions**

**Smoke alarms with ionization technology are the most popular types sold in the United States.**

**The NFPA recommends smoke alarms be installed in EVERY room and area of your home or building for complete protection. For maximum protection, install at least one ionization and one photo-electronic smoke alarm on each level of your home.**

**All smoke alarms should be replaced after 10 years of operation. Ten years is a smoke alarm's useful lifetime and for continued, reliable safety and protection, smoke alarms need to be replaced.**

**Consumer's should consult their owner's manual for specific instructions when locating a smoke alarm. The following are some general guidelines:**

**Because smoke rises, smoke alarms should be installed on the ceiling or on walls at least 4 to 6 inches below the ceiling.**

**Smoke alarms should not be located less than 4 to 6 inches from where the wall and ceiling meet on either surface; this space is dead air that receives little circulation.**

**Smoke alarms should not be mounted in front of an air supply, return duct, near ceiling fans, peaks of A-frame ceilings, dusty areas, locations outside the 40 degree Fahrenheit to 100 degree Fahrenheit temperature range, in humid areas or near fluorescent lighting.**

**If you hear the smoke alarm, roll to the floor and crawl to the door. Stay low where the air is cleaner and cooler. Touch the door. If the door feels cool, open it just a crack and check for smoke. If there is no smoke, leave by your planned escape route. Crawl and keep your head down. If the door feels hot, do not open it. Do no panic. Escape out the window or use an alternate exit.**

**If you can't leave your room, seal the cracks around the doors and vents as best you can. Use a wet towel or clothing if possible. Open a window at both the top and bottom. Stay low and breathe fresh air. Shout for help and signal your location by waving a bright cloth, towel or sheet out of a window.**

**If you live in a high rise building, never use the elevator to escape fire. If the fire blocks your exit, close your apartment door and cover all cracks where smoke could enter. Telephone the fire department, even if fire fighters are already at the scene, and tell them where you are. Shout for help and signal your location by waving a bright cloth, towel**

or sheet out of a window.

**If your clothes catch on fire, "Stop, Drop and Roll" to put out the flames. Do not run-running will only increase the flames.**

**Photo-electronic alarms contain a light emitting diode (LED) which is adjusted to direct a narrow infrared light across the unit's detection chamber. When smoke particles enter this chamber they interfere with the beam and scatter the light. A strategically placed photodiode monitors the amount of light scattered within the chamber. When a pre-set level of light strikes the photodiode, the alarm is activated.**

**Photo-electronic smoke alarms respond first to slow smoldering fires. A smoldering fire generates large amounts of thick, black smoke with little heat and may smolder for hours before bursting into flames.**

**Photo-electronic models are best suited for living rooms, bedrooms and kitchens. This is because these rooms often contain large pieces of furniture, such as sofas, chairs, mattresses, counter tops, etc. which will burn slowly and create more smoldering smoke than flames. Photo-electronic smoke alarms are also less prone to nuisance alarms in the kitchen area than ionization smoke alarms.**

**The use of both ionization and photo-electronic smoke alarms will provide a home with maximum protection and an ample warning in the event of a fire.**

**Families should get together and draw a floor plan of their home. They should show two ways out of every room. The first way should be out a door and the second way could be through a window. If it is a second or third story window, they might consider purchasing a safety ladder. They should choose a meeting place for all family members outside the home and mark it on the plan. A good meeting place would be a driveway, tree or a neighbor's home.**

**Families should practice the escape plan to make sure everyone understands the planned routes. Involve every member of the family. Start with everyone in their beds with the doors closed. Have one person sound the smoke alarm. Have each person touch his or her door. (Tip: sleep with bedroom doors closed. A closed door will help show the spread of fire, smoke and heat). Practice low escape routes-one for a cool door and one for a hot door. Meet outdoors at the assigned meeting place. Designate one person to call the fire department. Make sure everyone knows the fire department or local emergency telephone**

number.

**Consumers should be advised of the following features when choosing a smoke alarm to best suit their needs:**

### **Alarm Silencer**

**Smoke detectors with an alarm silencer feature will silence an alarming unit for several minutes, giving the air time to clear. These models are ideal near kitchen and cooking areas where most nuisance alarms occur. Note: consumers should always determine the reason for the unit sounding before quickly dismissing it as a nuisance alarm and pressing the alarm silencer feature to silence the alarm.**

### **Long Life Smoke Detectors**

**The NFPA reports that 1/3 of all smoke detectors installed in homes are not operating because of dead or missing batteries. This is an all too common occurrence in smoke detectors that leaves families and homes vulnerable.**

**Long life smoke detectors utilize lithium batteries that provide up to 10 years of continuous protection. Lithium batteries eliminate the need and expense of semi-annual battery replacement. When long life smoke detectors near the end of their tenth year in operation, they will sound a low battery signal to remind consumers to replace the entire unit.**

**Note: it is recommended that smoke detectors be replaced every 10 years and be tested regularly.**

### **Emergency Light**

**Some smoke detectors have a built-in emergency light that will turn on when the unit goes into alarm. The emergency light will illuminate an escape route in case of a power failure. These units are best utilized when installed by stairs and in hallways.**

### **Hardwire**

**Hardwire smoke detectors are connected to a home's AC power supply and should be intalled by a licensed electrician according to the local electrical code. AC power means you never have to replace a battery to protect your home and family**

