



## EPHRATA FIRE DEPARTMENT

### *Position Statement*

# Smoke Alarms – Ionization and Photoelectric Technology

February 2008

*Aligned with the INTERNATIONAL ASSOCIATION OF FIRE CHIEF'S FIRE & LIFE SAFETY SECTION, the Ephrata Fire Department's position on Ionization and Photoelectric Smoke Alarm Technology is as follows:*

In controlled experiments conducted by the NATIONAL INSTITUTES FOR STANDARDS AND TECHNOLOGY (NIST), ionization alarms react earlier than photoelectric alarms in fast-flaming fires, such as those involving paper or flammable liquids, while photoelectric alarms tend to react substantially earlier than ionization alarms in smoldering fires, such as those ignited by cigarettes in upholstered furniture, bedding materials, and mattresses.

While it is generally recognized that each sensing technology may be better in particular applications, it is impossible to predict what type of fire will occur in a typical residence.

Therefore, fire safety experts recommend that a home have a combination of both ionization and photoelectric smoke alarms or dual sensor smoke alarms that incorporate both type of sensing technologies in one unit to ensure the fastest response to both flaming and smoldering fires.

*It is vitally important to note that smoke alarms are only effective when they work. Smoke alarms should never be disabled, and must be tested, cleaned, maintained and replaced according to manufacturers' instructions.*

**The Ephrata Fire Department advocates the following fire safety advice:**

1. There are two main types of technologies used in smoke alarms to detect smoke. Both technologies detect all types of growing fires. ***Ionization alarms***, which sell for about \$5 for battery-operated models, respond faster to flaming fires, such as those involving paper or flammable liquids. ***Photoelectric alarms***, which sell for about \$20, respond faster to smoldering fires, such as those ignited by cigarettes in upholstered furniture, bedding materials, and mattresses. ***Dual sensor smoke alarms*** use both ionization and photoelectric sensors and cost about \$30.
2. Smoke alarms that use either type of sensing technology have been proven to save lives, prevent injuries, and minimize property damage by detecting and alerting residents to fires early in their development, and that the risk of dying from fires in a home without smoke alarms is twice as high as in homes that have working smoke alarms.

3. Since it cannot be predicted what type of fire will start in a home, it is important that both smoldering and flaming fires are detected as quickly as possible. The best protection is to have both types of smoke alarms installed, or install dual sensing technology smoke alarms that incorporate both ionization/photoelectric sensors.
4. Working smoke alarms should be installed on every level of the home, outside sleeping areas and inside bedrooms, as per manufacturer's specifications. Furthermore, smoke alarms can only offer protection if they are working, and as such, they should be tested, and maintained in accordance with the manufacturer's specifications.
5. If smoke alarms are battery operated or have battery back-up, the batteries should be replaced at least once a year during the IAFC's "Change your clock, change your battery" program in October. In addition, experts say that the entire smoke alarm itself should be replaced every 10 years.
6. Batteries should never be removed to disable a smoke alarm, even if you experience "nuisance" alarms, such as while cooking or showering. Simply fan the detector with a newspaper or towel to stop the alarm. Clean the smoke alarm according to the manufacturer's instructions, and consider relocating it away from the kitchen or bathroom. Some smoke alarms have a silencing or "hush" feature, so nuisance alarms can be stopped quickly and easily. Other smoke alarms use a long-life sealed battery unit so the battery cannot be removed.
7. Studies have shown that some children may not awaken from the sound of a smoke alarm for a variety of reasons. Parents and care providers should conduct a fire drill when their children are sleeping so they can assess their children's ability to awaken and respond appropriately. If children, or any other family members, do not awaken or do not react appropriately to the smoke alarm, the home escape plan should be modified accordingly to ensure that all family members are able to get out safely. The IAFC is aware of certain types of alarms that project a recording of the parents' voice or some other sound to which children may be more responsive than the traditional alarm.
8. For elderly people, those who have impaired hearing or those who have other disabilities that make the alarm difficult to hear, there are smoke alarms that use strobe lights and vibrators in addition to sound. Exploring alternative approaches such as these may make sense in those households.
9. The NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) reports that the provision of both smoke alarms and residential fire sprinklers increases survivability of a fire in a home by 82% over having neither.
10. Develop and regularly rehearse an escape plan with all members of your household, so that when the smoke alarm sounds, everyone will move to a safe location outside the home. For information on how to develop a home escape plan, see <http://www.nfpa.org/assets/files/PDF/FPWgrid03.pdf>.