



MARQUETTE TOWNSHIP FIRE DEPARTMENT

A GUIDE TO PURCHASING YOUR SMOKE DETECTOR

HOW SMOKE ALARMS WORK:

Ionization. The ionization smoke detector uses a radioactive source (typically Americium-241, an alpha emitting radionuclide) to ionize the air within the sensing chamber. The ionization of air by the radioactive particle causes a very small flow of electrical current. When smoke from a fire enters the chamber, its presence causes a reduction in the current's flow. The electronic circuitry senses the reduced flow and triggers the alarm horn.

Photoelectric. Photoelectric smoke detectors use the principle of scattered or reflected light to indicate the presence of visual smoke. They work much like the automatic eyes used to open doors. When there's no smoke, the chamber is dark. The light shines across the chamber and is received in a light trap on the far side. When smoke is present in the chamber, a photocell located at right angles to the light source senses the light scattered off the smoke particles and, at a certain level of illumination, triggers the alarm horn.

HOW DO THEY COMPARE:

Both detectors sense the presence of smoke. The photoelectric detector senses the large, visible smoke particles. The ionization detector senses the small, invisible particles.

If a fire starts and slowly smolders in upholstery without visible flame, a good photoelectric unit would be superior to a good ion chamber detector in terms of detection time. But, if the fire has flames, a good ion chamber will detect it faster than a good photoelectric detector.

An NFPA study of 1982 multiple death fires shows that residential fires accounted for nearly 90 percent of the fires and 85 percent of the deaths. This study also showed that 83 percent of the fires originated in the living room, 20.8 percent in the bedroom, 11.7 percent in the kitchen, 7.6 percent at exits, 5.1 percent in a structural area, 1.5 percent in a heating equipment room, and 3 percent in other areas. About 81 percent of the multiple death fires occurred between 8 p.m. and 8 a.m., when people are asleep and unaware of the development of a fire until it is too late.

Several studies have shown that ionization detectors may not sound early enough to permit escape. A Boston Fire Department report shows photoelectric smoke detectors activating 9 minutes sooner than an ionization type detector in a smoldering fire (the kind of fire which leads to deaths). An additional test of a flaming fire showed the ionization detector sounding first, but by only 14 seconds faster than the photoelectric detector.

WHATS THE SOLUTION?

While either type of smoke detector is better than none at all a [dual sensing](#) detector that has both photoelectric and ionization detections is the best way to safeguard your home and family.