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СУМСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ
КАФЕДРА ІНОЗЕМНИХ МОВ
ЛІНГВІСТИЧНИЙ НАВЧАЛЬНО-МЕТОДИЧНИЙ ЦЕНТР

МАТЕРІАЛИ ІХ МІЖВУЗІВСЬКОЇ
НАУКОВО-ПРАКТИЧНОЇ КОНФЕРЕНЦІЇ
ЛІНГВІСТИЧНОГО НАВЧАЛЬНО-МЕТОДИЧНОГО ЦЕНТРУ
КАФЕДРИ ІНОЗЕМНИХ МОВ

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SMOKE DETECTOR

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A smoke detector is made to alert people when the fire begins. It has already saved millions of lives and it is still rather promising for the future.

The first electric fire alarm was invented by Francis Robbins Upton in 1890. After many years of modifications in 1951 the first ionization smoke detectors were created and were placed in the market in the United States. They were used only in major commercial and industrial facilities in the next several years due to their high expense and large size. The first single-station smoke detector was invented in 1970. It was an ionization detector powered by a single 9-volt battery. It cost about \$125 and sold at a rate of a few hundred thousand per year.

The two common types of smoke detectors which are used today are ionization detectors and optical ones. An ionization smoke detector uses a radioisotope such as americium-241 to produce ionization in air; a difference due to smoke is detected and an alarm is generated. The radioactive isotope americium-241 in the smoke detector emits ionizing radiation in the form of alpha particles into an ionization chamber (which is open to the air) and a sealed reference chamber. The air molecules in the chamber become ionized and these ions allow the passage of a small electric current between charged electrodes placed in the chamber. If any smoke particles pass into the chamber the ions will attach to the particles and so will be less able to carry the current. An electronic circuit detects the current drop, and sounds the alarm. An ionization type smoke detector is generally cheaper to manufacture than an optical smoke detector; however, it is sometimes rejected because it is more prone to false (nuisance)

alarms than photoelectric smoke detectors. It can detect particles of smoke that are too small to be visible.

The second type is an optical detector. The components of the light sensor are the light source (incandescent bulb or Light-emitting diode), a lens, and a photoelectric receiver (typically a photodiode). A wall-mounted unit emits a beam of infrared or ultraviolet light which is either received and processed by a separate device or reflected back to the transmitter/receiver by a reflector. Photoelectric alarms react slower to rapidly growing fires than ionization alarms, but laboratory and field tests have shown that photoelectric smoke alarms provide adequate warning for all types of fires and have been shown to be far less likely to be deactivated by occupants. In large open areas such as atria and auditoriums, optical beam smoke detectors are used.

Ionization detectors are more sensitive to the flaming stage of fires than optical ones, while optical detectors are more sensitive to fires in the early smouldering stage. Although optical alarms are highly effective at detecting smouldering fires, they do provide adequate protection from flaming fires. Ionization ones as a rule are made for civil houses or little shops, because their active radius is only 20 meters. You can find optical ones in bigger shops or large facilities.