



## Smoke Verification: How It Works, Why It Matters & How It Started

### 1. History of Smoke Detection

#### Early Foundations (Late 19th – Early 20th Century)

- 1890 – The first automatic electric fire alarm was patented by Francis Robbins Upton, an associate of Thomas Edison. This device marked the beginning of electrically triggered fire alerts.
- 1902 – Engineer George Andrew Darby patented the first heat detector in Birmingham, England. It relied on a melting material (originally even a block of butter) to close an electrical circuit and signal a fire.

#### Accidental Breakthroughs in Smoke Detection

- Late 1930s – Swiss physicist Walter Jaeger was developing a sensor for poison gases. In a stroke of serendipity, when he lit a cigarette, his instrument unexpectedly reacted—leading to the early principles of the ionization smoke detector.
- 1939 – Swiss physicist Ernst Meili enhanced this concept by devising an ionization chamber device with a cold cathode tube, capable of amplifying detection signals—setting the stage for modern ionization smoke detectors.

#### Smoke Detection Reaches Homes

- 1951 – Ionization smoke detectors first became commercially available in the United States. Initially, they were large and expensive, mostly used in industrial or commercial settings.
- 1965 – Engineers Duane D. Pearsall and Stanley Bennett Peterson developed the first practical, affordable battery-powered home smoke detector, known as the SmokeGard 700. This innovation revolutionized home safety by making smoke alarms accessible and easy to install.
- 1970s onward – Mass production of these smoke detectors began, greatly reducing fire-related deaths across homes.

### 2. How Smoke Verification Works

Most systems use a two-step process:

1. Initial Activation – A smoke detector senses particles of combustion and sends an alarm signal to the control panel. Instead of immediately activating notification appliances, the



panel enters a verification period.

2. Verification Period – During this time (often 30–60 seconds, configurable per NFPA 72 allowances), the panel monitors the initiating device to see if the alarm condition persists. If the signal returns within the set time, the panel confirms the alarm and activates the notification circuits. If not, the system resets without generating an alarm.

### 3. Why Smoke Verification Matters

- Reduces false alarms from non-fire sources such as dust or steam.
- Enhances building operations and reduces disruptions.
- Lowers risk of costly false-alarm fines.

### 4. NFPA 72 & Code Compliance

- Verification periods typically kept within 60 seconds per NFPA 72.
- Not permitted in high-hazard or residential sleeping areas, as delay could compromise safety.

### 5. Best Practices for Implementation

- Confirm approval with your local authority having jurisdiction (AHJ).
- Apply smoke verification in nuisance-prone areas—not high-risk zones.
- Test verification logic during routine fire alarm maintenance.
- Train staff to understand and respond to verification delays appropriately.

### 6. Conclusion

From the simple heat sensors of the early 1900s to the accidental insight that gave us ionization-based smoke detection—and finally, the widespread, accessible home alarms of the 1960s—smoke detection technology has come a long way. Today, smoke verification builds upon this history, aiming to enhance reliability and reduce false alarms, while preserving life-safety standards.