

THE COMBO CON

Combination Ionization/Photoelectric Smoke Alarms

**Why The International Association
of Fire Chiefs Said “No.”**

“What about the use of a combination photoelectric/ionization detector?
...What is to be gained from adding an ionization element to a photoelectric
element? **In the subcommittee’s opinion, nothing.”**

International Association of Fire Chiefs, ‘Residential Smoke Alarm Report’ (Sept, 1980)

**“When you mix clear water with muddy
water - you still have muddy water.”**



Chief Marc McGinn
Albany Fire Department, California, USA

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Why Haven't We Been Told?

September, 1980

The International Association of Fire Chief's (IAFC)

'Residential Smoke Alarm Report':

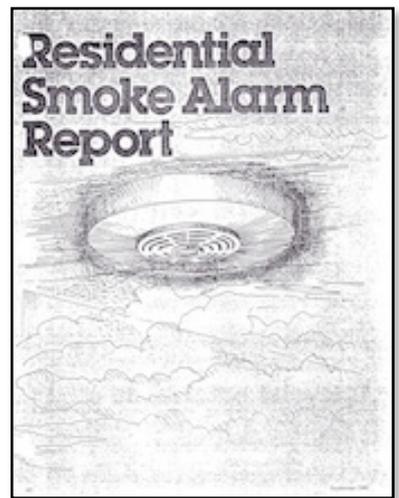
"Therefore, because of the present state-of-the-art in detecting smoke, the Subcommittee on Smoke Detection can take no other course but to recommend the installation of photoelectric detectors. . .

What about the use of a combination photoelectric/ionization detector? . . .

What is to be gained from adding an ionization element to a photoelectric element?

In the subcommittees opinion, nothing."

IAFC's 1980 'Residential Smoke Alarm Report' emphasis added



IAFC's 1980 Report
"No" to Combos

Why America Is Burning

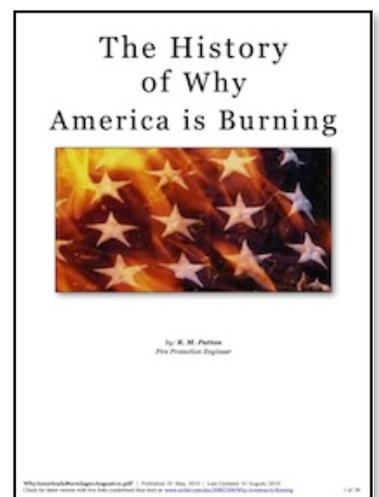
- The IAFC warned about ionization smoke alarms in September 1980;
- They said they could *only* recommend photoelectric smoke alarms;
- They said "No" to combination ionization/photoelectric smoke alarms, so;

- 1. Why weren't fire fighters and the public warned about ionization smoke alarms?
- 2. Why have campaigners been ignored for 34 years, since the 1976 'Smoke Detector Fraud Report', despite decades of trying to reveal the truth?
- 3. What have NIST, UL, the NFPA and the CPSC failed to warn the public, **when they had documentary evidence proving beyond all reasonable doubt that ionization smoke alarms have dangerous defects?**

'The History of Why America Is Burning'

The history of how the truth about "deadly" ionization smoke alarms has been kept from fire officials and the global public for over three decades resulting in tens of thousands of needless deaths around the world.

by Richard M Patton
Fire Protection Engineer, Sacramento, USA
COMING SOON



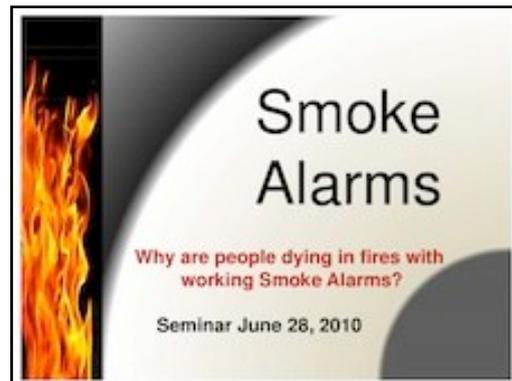
Why the International Association of Fire Chiefs said “No” to Combination Ionization/Photoelectric Smoke Alarms:

1. False Alarms

Ionization smoke alarms are so prone to false alarms, studies show that approximately 30% of people [disconnect them](#).

The world’s largest smoke alarm manufacturer, BRK, has produced a document stating it will support legislation to mandate the use of stand-alone photoelectric smoke alarms. The reason? Scientific evidence showing the unacceptably high disconnection rate of smoke alarms incorporating ionization technology (either stand-alone or dual sensor): www.TheWFSF.org/brk

For more information on research about the ionization smoke alarm disconnection problem, see the Fathers For Fire Safety video and presentation notes (slides 31 - 38) at: www.TheWFSF.org/uc7



Father For Fire Safety Presentation explains unacceptable disconnection problem due to excessive false alarms

2. Increased Cost

Combination alarms come at a significant increase in cost. There is a direct correlation between at-risk groups from fire deaths and low income. Therefore, those on a limited budget may be able to protect less rooms in a given home with combination alarms as opposed to stand-alone photoelectric alarms.

Whilst the following reasons were not cited in the IAFC’s 1980 ‘Residential Smoke Alarm Report’ they prove the IAFC got it right:

3. Confusion: “And’ Gate, ‘Or’ Gate, or “Algorithm?”

The May 2009 study by the Worcester Polytechnic Institute, Massachusetts, USA, exposes critical information about combination ionization/photoelectric smoke alarms that most fire fighters, yet alone the public, are unaware of:

“However, combination units also have their drawbacks. Detectors can be combined using either an “AND” gate or an “OR” gate (Ian Thomas Interview, Appendix L). An OR gate will sound an alarm if the unit receives a signal from either one of the detectors. This means that the unit will sound at the earliest possible time, but also that the unit is susceptible to the most nuisance alarms due to the cumulative weaknesses of each detector. A unit designed with an AND gate will not sound until it receives a signal from both detectors.”

www.TheWFSF.org/wpi

4. Environmental - AM241



AM241 Ionization smoke alarms contain Americium 241, a highly radioactive isotope.

Manufacturers argue it is only a ‘small’ amount of AM241 contained within the alarm/detector. However,

Why is it a requirement in Australia that if more than 10 are being disposed of at any one time they must not go into landfill?



Typical Ionization Smoke Alarm Showing AM241 radioactive warning sticker

As all ionization smoke alarms contain radioactive material, regulations do not allow them to be sent through Australia Post. Therefore how are consumers going to return them to the manufacturer or the State health department as required?

If ionization alarms are subjected to a high heat fire the AM241 may be released into the atmosphere and inhaled by fire fighters or citizens. Some argue this is a potential health risk.

How long does AM241 remain radioactive?

The AM241 in an ionization smoke detector has a half-life (i.e. how long it takes for a substance undergoing decay to decrease by half), of 432.2 years. The amount of AM241 declines slowly as it decays into neptunium-237 which has a half life of about 2.14 million years.

Photoelectric smoke alarms contain no radioactive material and pose no health risk.

5. Compulsory in Commercial Buildings

It is a legal requirement that new commercial buildings in Australia must have photoelectric alarms or detectors fitted in all sleeping area and in all exit paths to which the standard applies (AS1670.1 April, 2004). Photoelectric smoke detectors are fitted in virtually all commercial buildings in the USA.

Why provide proper protection in commercial buildings and not for our homes?

6. “You Have Two Types of Fire so You Need Two Types of Smoke Alarms” - True or False?

Since the mid 60’s fire authorities have almost exclusively promoted ionization smoke alarms. However, since the 1976 ‘Smoke Alarm Fraud Report’ campaigners have been warning that ionization smoke alarms are “[deadly](#)” and that they should immediately be banned and recalled.

“You don’t know what kind of fire you’re going to have, fast burning fire which ionizations prefer or a smoldering smoke fire which photoelectric’s better.”

Claim made at 2nd reading of Albany’s Smoke Alarm Ordinance, July 19, 2010



Howard Hopper, UL

In June 2006, the [Barre City Fire Department](#) in Vermont, USA, discovered the facts after the

Chief lost his niece and four of her children in a home fitted with hard-wired, so-called working ionization alarms. Because of this, the truth about ionization alarms began to emerge. So how could the smoke alarm industry cover up the fact it told the public ionization smoke alarms were safe when many tens of thousands people had needlessly had been killed or maimed over more than three decades?

It was easy - by adding the flawed (ionization) technology with the effective (photoelectric) technology no one would know about the deadly defects with ionization alarms. That’s why the claim, “*There are two types of fire so you need two type of smoke alarms*” is so insidious. And yes - on the surface it does sounds impressive, it even appears to make sense. But is it valid?

Smoke Detector Seminar
 UNIVERSITY OF Cincinnati College of Engineering & Applied Sciences
 “Is it possible that the recommendation for dual or for both is maybe a compromise to transition away from ionization detectors?”
 Captain Clayton L. James
 Newport Fire Department, Kentucky, USA
[More >>>](#)
 Capt. Clayton James

Firstly, did it occur to you these ‘experts’ now claiming you need two types of smoke alarms should have been telling you this decades ago?

Here is the truth. In many cases there are two **stages** of fire, smoldering and flaming, and you **MUST** detect the fire in the smoldering *stage*, before the fire breaks into the flaming *stage* - because once it breaks into flame it is almost always far too late.

Note: For more information, see ‘The S.A.F.E. Report’ on page 9

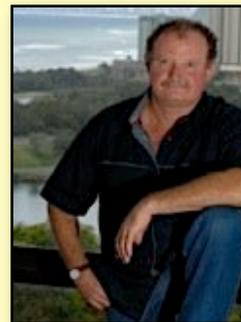
7. “Muddying the Water”

“If you tell the public to buy photoelectric or combination ionization/ photoelectric smoke alarms because “they’re better” - most people will do absolutely nothing.

Why should they? Their ionization smoke alarms go off when they open the oven or cook toast, so people think they’re safe.

The public must be given a clear, no-compromise message:

1. Stand-alone ionization smoke alarms are “deadly” because they do not safely detect smoldering fires, and;
2. They are so prone to false alarms why handicap the superior photoelectric alarm with an inferior ionization sensor?”



Adrian Butler
Chairman, WFSF
Former Fire Fighter

Albany Fire Department’s No-Compromise Stand



“When you mix clear water with muddy water - you still have muddy water.”

Chief Marc McGinn
Albany Fire Department, California, USA

See Albany’s Stand on
Photoelectric-Specific
Legislation

[Here >>>](#)



A Message from Karl Westwell

The World Fire Safety Foundation

Co-Founder

The Problem With Combination Ionization/Photoelectric Smoke Alarms

The following information has been extracted from an email sent by Karl Westwell, Co-Founder of the World Fire Safety Foundation, to a Californian Fire Marshall on 04 August, 2010 . . .

Flaws and Inconsistencies

You stated: "I understand the lack of trust, but isn't there the exact same issue with photoelectric only? Don't all of these manufacturers offer the full spectrum of configurations? They can just as easily hide inconsistencies and designs or adjustments that are less sensitive in photoelectric only alarms."

Absolutely. I have very real concerns that under present standards and testing regimes that we can have smoke alarms (of any type) that have been set to one level of sensitivity in order to gain approval, yet that same model of alarm may be set to a different sensitivity when sold to the public. I understand the need for tolerances for manufacturing, but in this day and age, we should be able to have negligible tolerances. Besides, it appears that the tolerances are not there for manufacturing, but precisely so that tested alarms can be set to pass the tests, while units sold to the public are set for less sensitive, so as to reduce nuisance alarms. The present standards and testing regime, in my opinion, are simply not good enough.

Combo Unit Technology

Presently, photo/ion units have either an 'and' or an 'or' gate. At its simplest, an 'and' gate requires both sensor types to activate before an alarm sounds. This reduces nuisance alarms, but in terms of protection, it is all but guaranteed to provide the least effective response time.

On the other hand, at its simplest an 'or' gate sounds an alarm when either one of the sensors activates. It can be argued that this provides the highest level of protection, but it also carries the highest risk of nuisance alarms and therefore the highest risk of disablement by a home occupier.

Neither of these is a good thing. So, to overcome these problems and come up with a viable compromise, manufacturers have introduced various algorithms to adjust sensitivities of the two sensors in order to provide a faster response with less nuisance alarms. Sounds good so far, right? But the problem is, the algorithms are designed with specific situations (fire scenarios) in mind. Some may be more suitable for, say, a kitchen area, others for a bedroom area. In order to try to provide the widest possible range of detection, the manufacturers have to make the algorithms more and more complex.

Complexity Increases Risk

The problem is, with complexity comes increased risk of malfunction. Two sensors, twice the risk of failure. Add in algorithms and the risk of failure becomes even greater. **Would you want to buy the Windows Vista of smoke alarms?**

Combo units are a minefield of complex issues and the smoke detection capabilities of various models will be wide-ranging, and what, on analysis is really to be gained that is not more than off-set by the risks?

Disclosure

Aside from the increased risk of malfunction, without adequate labelling regulations, how is the consumer to know whether a combo unit uses an 'and' or 'or' an gate or an algorithm, and, if an algorithm, how a specific algorithm works and what situation that alarm is best suited for?

When asked why they did not warn the public of the limitations of the ionization detector and advise of the different detection types, manufacturers have defended themselves in media and in the courts by saying: "We did not want to confuse the public" (e.g. see *Mercer vs BRK*, May 1998). These issues with 'and' or 'or' gates and algorithms are much more complex.

Given their history of not wanting to confuse the public, are they really going to want to provide full disclosure on these issues, which are far more complex? And when they have, in the past, provided some level of disclosure, they have played down the differences and often removed critical adjectives, effectively emasculating even NIST's already watered-down conclusions.

Is this full disclosure going to be on the outside of the packaging so consumers can read it before they buy the product, or will it be on a leaflet inside? And what good would that really do anyway? How many people read the product data sheets?

Apathy and Complexity

Most medicines come with a lengthy disclosure statement. But how many of us read those? Most don't, instead they trust their doctor's advice. But who is there to advise consumers when they are buying a smoke alarm? It ain't a doctor. It's a pimply teenage kid who, during his training on smoke alarms - if he received any *real* training on smoke alarms at all - was preoccupied with thoughts of the cute cheerleader who smiled at him the night before.

Consumers generally think that a home fire will never happen to them, so educating themselves thoroughly on this issue is not a priority. Smoke alarms are not a high-margin, fast-moving stock item, so most retailers pay scant attention to training. Call into almost any fire department, talk to every firefighter you see, and you'll find that most don't know the performance differences between ions and photos as it is, let alone the differences between different combo types and algorithms.

Mixed Messages

The promotion of combo units results, not in action, but in more inaction. How do you say there is something is wrong with ions, when you are promoting an alarm that is half ion? In a combo unit, to reduce nuisance alarms, whether with an 'and' gate or an algorithm, you have to reduce the sensitivity of the ion in some way, further reducing any advantage it has over a photoelectric-only alarm.

Failure to Confront the Issue

The other thing about the combo units is this: so long as we have combos, it allows the issue with ions to be swept under the rug - the false advertising, the manipulations of statistics, the obfuscation of test data, etc., to be quietly put to one side. Combo units not only add unnecessary complexity with the increased risk of malfunction for what are, at best, negligible gains, they also help to ensure that the public do not get to see that the emperor has no clothes: that the device hailed as the greatest success story in life safety in the last part of the 20th century (NIST 2004 HSAT report) is in fact a fraud.

Smoke Alarm Mythology

Like the Wizard of Oz, the smoke alarm has become this mighty hero, the saviour of all the populace. But draw back the curtain and the Wizard doesn't stand quite so tall. Mid-70's: Less than 15% of homes have smoke alarms - 8 fire deaths per 1,000 home fires. Mid-00's: 95% of homes have smoke alarms - 8 fire

deaths per 1,000 home fires. ***How can the smoke alarm be credited as the 'greatest success story in life safety in the last part of the 20th century' when for every 1,000 home fires we still have just as many people killed as before?***

Photoelectrics are Not Enough

Saying 'install photos' is not the end of the story. The industry (standards, testing organizations, regulators, manufacturers, fire services, etc.) needs to lift its game. We need better photos. Some of the models out there are rubbish and should not be allowed on the market. We need better standards for smoke alarms (we have a few ideas on this) We need more effective regulations. We need to be saying, "hey, you know what, no type of smoke alarm is good enough, we also need to be mandating home sprinkler systems" (we have some ideas on these as well).

Time for Change

I believe that the fire service needs to stand up on this one. I believe that as one of the most trusted professions, our fire services need to take the lead here, they need to stand up and say that NIST and UL and others have dropped the ball on this, as I believe they hold the power and the influence with the public (and thus with politicians) to force a change.

With regard ions, the fire service were duped. They became a pawn in the manufacturer's game. In the early days of our campaigning, we were laughed at and derided by fire services, told we did not know what we were talking about. Now, years later, those same fire services have now adopted our stance on photos as their official position. Yet, even so, so far as the public is concerned they sit on the fence, afraid of the damage to their reputation if they come out boldly, because do that ... and the public may start to ask some uncomfortable questions.

We have emasculated conclusions to studies, we have impotent standards, I am thankful to see that there are people like Chief McGinn, the Albany City Council, yourself . . . to be honest, for a few years there I as wondering if anyone in this industry had any testosterone.

Time to Put Things in Order

I am not on a vendetta. I know there are those who want to see companies bankrupted, people put on trial from criminal negligence, etc., But I have publicly stated that I believe the best way forward would be to have an amnesty: bring everything out on the table, look where it went wrong and make sure we do better next time. If South Africa could progress healing with its Truth and Reconciliation hearings rather than vengeance for past wrong, then maybe we should be doing the same.

The Simple Solution

The reality is: no smoke alarm, no matter what type, will ever provide 100% fail safe detection. However, on analysis, the photoelectric smoke alarms provides the best all-round detection with the lowest incidence of nuisance alarms.

Albert Einstein said:

"Everything should be made as simple as possible, but not simpler."

I think the photoelectric fits this criteria perfectly.

Karl Westwell

The World Fire Safety Foundation

Co-Founder, CEO

THE S.A.F.E. REPORT

S M O K E



A L A R M

NIST

F R A U D



E X P O S E D



The SAFE Report is a living document. It may be updated as new information emerges. Read after watching 'Smoke Alarm Recall' at: www.TheWorldFireSafetyFoundation.org
Check for latest version at: www.TheWorldFireSafetyFoundation.org/sr

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