



Australasian Fire Authorities Council

Position on Smoke Alarms in Residential Accommodation

June 1 2006



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Preamble

The Australasian Fire Authorities Council (AFAC) believes that smoke alarms save lives and that the correct type and number should be installed in all residential accommodation.

This paper expresses AFAC's position on a number of issues related to domestic smoke alarms installed in residential accommodation. Residential accommodation includes buildings defined by the *Building Code of Australia* as Class 1 buildings and sole occupancy units in Class 2, 3 & 4 buildings.

This position is based on emerging knowledge about smoke alarm performance. This position may change following further research into the performance of smoke alarms in the Australasian environment.

AFAC encourages further research into the performance of smoke detection devices in the Australasian residential environment and supports the need for ongoing review, development and testing through the Australian Standards review process.

For the purposes of this paper:

- A smoke alarm is a device that contains a means of detecting smoke or products of combustion and for sounding an alarm; and
- A domestic smoke alarm is one manufactured principally for use in the home.

Purpose

The purpose of this paper is to support AFAC's efforts to inform and educate home owners and occupiers about best practice in regard to domestic smoke alarms and to influence Government to adopt consistent and effective smoke alarm provisions across Australia.

Position

1. Compliance

- That all domestic smoke alarms installed in residential accommodation comply with Australian Standard (AS) 3786.

2. Power supply

- That smoke alarms installed in permanent residential accommodation shall comply with the power supply requirements of AS 3786, including that they:
 - be hard-wired direct to a 240 volt AC power supply; or
 - be hard-wired to a 12/24 volt DC system powered by a 240 volt supply; or
 - be powered by an integral, non-removable battery with a life span at least equal to that of the smoke alarm.
- That hard-wired smoke alarms be wired to the un-switched active side of a light circuit.
- That hard-wired smoke alarms be equipped with an integral battery back-up so that power is still available to the smoke alarm in the event of failure of the 240 volt supply.

3. Type

- That all residential accommodation be fitted with photo-electric smoke alarms.

Note 1: There are two principle types of smoke alarms, ionisation and photo-electric smoke alarms. Ionisation smoke alarms predominantly detect the presence of extremely small particles of smoke whilst photo-electric smoke alarms predominantly detect visible smoke.

Note 2: Some research indicates that both ionisation and photo-electric smoke alarms provide occupants time to escape. AFAC's position however is based on current knowledge about smoke alarm performance; that is, that photo-electric alarms are generally more effective than ionisation alarms across the broader range of fire experienced in homes, and should be promoted as the technology of choice.

Note 3: Current research indicates that:

- *ionisation smoke alarms detect flaming fires marginally earlier than photo-electric smoke alarms.*
- *photo-electric smoke alarms detect smouldering fires and fires starting in areas remote from smoke alarms significantly earlier than ionisation smoke alarms.*
- *ionisation smoke alarms may not operate in time to alert occupants early enough to escape from smouldering fires.*
- *for both flaming fires and smouldering fires, photo-electric smoke alarms are likely to alert occupants in time to escape safely.*

Note 4: As many fires in residential accommodation begin as smouldering fires, photo-electric smoke alarms provide more effective all-round detection and alarm than ionisation alarms.

Note 5: Householders may choose to maintain ionisation smoke alarms until the end of their service life. However, householders should also install photo-electric smoke alarms in accordance with the locations described below.

Note 6: Smoke alarms fitted with dual photo-electric / ionisation detectors are available. Householders may choose to install such alarms in lieu of photo-electric alarms. However, research indicates that they are more costly and prone to more false alarms than photo-electric alarms, and the benefits are marginal.

4. Location

- That smoke alarms in single dwellings (Class 1 buildings) be located in all sleeping areas and in all paths of travel between sleeping areas and exits to the open air.
- That smoke alarms in buildings containing 2 or more separate dwellings (Class 2 and Class 4 buildings) be located in all sleeping areas and in all paths of travel between sleeping areas and exits to common corridors.
- That smoke alarms in multi-level dwellings, in addition to the above provisions, be located in the path of travel between each level in such dwellings.
- That due consideration be given to the effect on smoke alarm performance of air conditioners, heaters, fans and other temperature control devices, and that smoke alarms

be located where these devices will not compromise the effectiveness of the smoke alarms.

- That, whenever possible, smoke alarms not be installed in close proximity to kitchens and bathrooms.

Note 7: Research indicates that a primary reason why smoke alarms do not operate when needed is because batteries have been removed after repeated false alarms. False alarms are often caused by steam from bathrooms or by cooking fumes. Research indicates that photo-electric alarms are less prone to false alarms from cooking fumes.

5. Installation

- That smoke alarms be installed with reference to manufacturers' instructions, and located in accordance with the *Building Code of Australia* and AS 1670 parts 1 or 6.
- That the responsibility for installation rests with the building owner, including, in the case of rental accommodation, the landlord.
- That 240 volt smoke alarms be installed by a licenced electrician.

Note 8: AFAC is satisfied that smoke alarms with a DC power source may be installed by competent persons who are not qualified electricians.

6. Temporary accommodation

- That battery-powered smoke alarms be used for temporary accommodation if 240 volt power is unavailable or impractical (eg. tents, boats, caravans).
- That in temporary accommodation, smoke alarms be installed in all sleeping areas.

7. Sound levels

- That the minimum smoke alarm sound pressure level at the bed head in all sleeping areas be 75 decibels.

Note 9: While this will not guarantee that all sleeping persons (particularly children under the age of 16, elderly people and the hard of hearing) will be woken by a smoke alarm, research indicates that adults with normal hearing are likely to be woken.

8. Smoke alarms for the deaf and hard of hearing

- That smoke alarms with sensory stimulation devices other than standard audible devices be installed in residential accommodation occupied by The Deaf or people who are hard of hearing.

Note 10: Alternative alarm methods may include alarm tones of varying frequency, vibrating pads and strobe lights.

9. Interconnection

- That all smoke alarms in single dwellings (Class 1 buildings) be interconnected.

Note 11: Interconnection of smoke alarms ensures that regardless of where a fire starts, all smoke alarms in a dwelling will sound to alert occupants at the earliest possible time.

10. Smoke alarms connected to security systems

- That smoke alarms connected to a security system:
 - meet **all** the requirements of AS 3786; and,
 - are installed and maintained in accordance with all the recommendations in this position.

11. Maintenance

- That smoke alarms be maintained as detailed in AS 1851.
- That the key smoke alarm maintenance routines are:
 - testing once per month to ensure the battery and the alarm sounder are operating;
 - cleaning with a vacuum cleaner annually to remove particles that will affect smoke alarm performance; and
 - replacing removable batteries annually, including removable batteries in smoke alarms powered primarily by 240 volts.
- That the responsibility for monthly smoke alarm testing rests with the occupant, and
- That the responsibility for annual battery replacement and cleaning, rests with, in the case of owner-occupied property, the occupant, and in the case of rented accommodation, the landlord.

12. Life expectancy

- That smoke alarms be replaced when the service life date, which should be clearly indicated in the base of each smoke alarm, is exceeded.

Note 12: AS 3786 stipulates that the maximum service life of a smoke alarm shall be 10 years.

13. Disposal

- That smoke alarms be disposed of as follows:
 - For ionisation alarms, in accordance with the recommendations of the Australian Radiation Protection and Nuclear Safety Agency, unless those recommendations are inconsistent with legislation applicable in the relevant State or Territory. Where local regulations allow, ionisation smoke alarms in quantities less than ten may be disposed of in domestic waste. Quantities of ten or more ionisation smoke alarms shall be treated as radioactive waste and disposed of in accordance with local regulations.
 - Photo-electric smoke alarms in any quantity may be disposed of in domestic waste.

14. Effect of domestic sprinkler systems

- That the presence of a domestic sprinkler system in a dwelling does not diminish the need for the installation of smoke alarms in accordance with these recommendations.

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