

DOMESTIC FIRE DETECTION

The installation of smoke alarms, or automatic fire detection and alarm systems can significantly increase the level of safety by automatically giving an early warning of fire. The following guidance is appropriate for most dwelling houses.

However, where it is known that the occupants of a proposed dwelling house are at a special risk from fire, it may be more appropriate to provide a higher standard of protection e.g. additional detectors.

SMOKE ALARMS

Ionisation Alarms

- These are the most popular alarms in part due to the fact that they are cheap to produce.
- They are activated by a wide range of fire situations and are particularly responsive to fast flaming fires where little visible smoke may be produced.
- They have a tendency to activate accidentally in non-fire situations such as cooking, the use of portable gas fires etc.
- They are slow to respond to smoke produced by slow smouldering fires.

Optical Alarm

- They are activated by a wide range of fires but are particularly responsive to smouldering fires and the dense smoke produced by foam filled furnishings.
- They are less likely to be activated accidentally by non-fire situations i.e. cooking.
- They can be activated by dust or insect contamination so it is important to keep them clean.

HEAT ALARMS

- These require little maintenance.
- They are ideal for use in kitchens where smoke alarms cannot be used yet where 40% of all house fires develop, but do take considerably longer to activate than smoke alarms.
- Fixed temperature heat alarms are generally recommended for domestic use, they are activated when the temperature reaches 58°C (136°F).
- Rate of heat rise type alarms are not generally recommended for domestic use as the steam from kettles and the heat from opened oven doors can activate them.

MAINTENANCE OF ALARMS

- Battery powered alarms are widely used, however it is estimated that at least a third would not activate because the battery has been removed or is flat.
- Building Regulations now require all new property to have mains operated alarms, which overcome these potential problems.
- It is therefore strongly recommended that mains operated alarms with rechargeable battery back up be installed. The additional cost involved will be more than offset by the life-saving potential of a more reliable system.

All new dwelling houses should be provided with a fire detection and fire alarm system in accordance with the relevant recommendations of BS 5839-6: 2002 to at least Grade D Category LD3 standard.

The smoke and heat alarms should be mains operated and conform to BS 5446-1: 2000 or BS 5446-2: 2003, respectively: Fire detection and fire alarm devices for dwelling houses, Part 1 Specification for Smoke alarms; or Part 2 Specification for heat alarms.

They should have a standby power supply, such as a battery (either rechargeable or non-rechargeable) or capacitor. More information on power supplies is given in clause 15 of BS 5839-6: 2004. Large houses require installations to a higher standard.

For minimum protection smoke alarms need to be situated in the hallway and the upstairs landing.

Positioning of Smoke and Heat Alarms

Detailed guidance on the design and installation of fire detection and alarm systems in dwelling houses is given in BS 5839-6: 2004. However, the following guidance is appropriate to most common situations:

1. Smoke alarms should normally be positioned in the circulation spaces between the sleeping places and places where fires are more likely to start (e.g. kitchens and living rooms) to pick up smoke in the early stages of a fire.
2. There should be at least one smoke alarm on every storey of a dwelling house.
3. Where the kitchen area is not separated from the stairway or circulation space by a door there should be a compatible interlinked heat detector or heat alarm in the kitchen, in addition to whatever smoke alarms are needed in the circulation space(s).
4. For maximum protection, all rooms where a fire is most likely to break out (e.g. living rooms, bedrooms and kitchens) should be fitted with an alarm / detector and they should be interlinked.

Where more than one alarm is installed they should be linked so that the detection of smoke or heat by one unit operates the alarm signal in all of them. The manufacturers' instructions about the maximum number of units that can be linked should be observed.

Smoke alarms / detectors should be sited so that:

1. There is a smoke alarm in the circulation space within 7.5m of the door to every habitable room. In addition, the British Standard recommends that no bedroom door is sited no more than 3m from a smoke detector / alarm;
2. They are ceiling-mounted and at least 300mm from walls and light fittings (unless, in the case of light fittings, there is test evidence to prove that the proximity of the light fitting will not adversely affect the efficiency of the detector). Units designed for wall-mounting may also be used provided that the units are above the level of doorways opening into the space and they are fixed in accordance with manufacturers' instructions; and
3. The sensor in ceiling-mounted devices is between 25mm and 600mm below the ceiling (25-100mm in the case of heat detectors or heat alarms).

Note: this guidance applies to ceilings that are predominantly flat and horizontal.

It should be possible to reach the smoke alarms to carry out routine maintenance, such as testing and cleaning, easily and safely. For this reason smoke alarms should not be fixed over a stair or any other opening between floors.

Smoke alarms should not be fixed next to or directly above heaters or air-conditioning

outlets. They should not be fixed in bathrooms, showers, cooking areas or garages, or any other place where steam, condensation or fumes could give false alarms.

Smoke alarms should not be fitted in places that get very hot (such as a boiler room) or very cold (such as an unheated porch). They should not be fixed to surfaces which are normally much warmer or colder than the rest of the space, because the temperature difference might create air currents which move smoke away from the unit.

Power Supplies

The power supply for a smoke alarm system should be derived from the dwelling house's mains electricity supply. The mains supply to the smoke alarm(s) should comprise a single independent circuit at the dwelling house's main distribution board (consumer unit) or a single regularly used local lighting circuit. This has the advantage that the circuit is unlikely to be disconnected for any prolonged period. There should be a means of isolating power to the smoke alarms without isolating the light.

Further advice can be obtained from:
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