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Fire Sprinkler Systems in Dwellings

Whilst historically the UK has tended to view sprinklers as an important part of the fire safety provision in industrial and commercial settings, recent years have seen a greater appreciation in the UK for the role fire sprinklers can play in saving lives and property in the home.

The growing acceptance of residential and domestic fire sprinklers is very welcome. Some of the previously widely held “urban myth” style misconceptions about sprinklers are now far less widespread. This is due in no small part to the work of the Fire and Rescue Services and organisations such as BAFSA and the National Fire Sprinkler Network (NFSN) and the National Fire Chiefs Council (NFCC) in educating the public about the benefits of sprinklers through publications, sprinkler week and seminars.

This growing acceptance of sprinklers in the home is not limited to the general public, a growing number of politicians are now more familiar with the benefits of sprinkler and, as with their constituents, are less accepting of the sprinkler myths such as “all the sprinklers will go off at once if I burn the toast!”

There has been a gradual downward trend in fire deaths in the home since 2010 this trend seems to have plateaued. Whilst the reduction in

fire related fatalities is laudable, many view the fire deaths in the home figures as still too high. There is still significant room for improvement, 77% of fire fatalities in England¹ and Wales² in 2018-19 were in residential properties. Whilst the figures in Scotland were slightly higher at 80%³.

Sadly, it is the more vulnerable members of society who are the most likely to be killed or injured. These people are often unable to respond to a warning of fire quickly enough, and cannot get out of their home before it's too late.

SMOKE ALARMS

There can be little doubt that increased smoke alarm ownership has been a major cause in the downward trend in fire deaths in the home⁴.

“...Home Office statisticians have calculated that you are around eight times more likely to die in a fire if you do not have a working smoke alarm in your home.”⁵



SMOKE ALARMS ALONE ARE NO GUARANTEE OF SAFETY



99%

SPRINKLERS CONTROL OR EXTINGUISH FIRES IN 99% OF CASES



BS 9251:2014 OR WITH NATIONAL ANNEX NA OF BS EN 16925:2018



However, smoke alarms alone are no guarantee of safety. Whilst early detection of a fire in the home will provide householders with more time to escape, this is of less benefit to those who cannot escape quickly or are unable to respond to the alarm. Smoke alarms do not control or suppress a fire.

Statistics show that older people and those with mobility and/or health issues which would impact on their ability to respond to a fire are deemed to be at higher risk from having an accidental fire in their home.

Alarmingly on 12% of occasions where smoke alarms operated in dwelling fires in Wales in 2018/2012⁶ occupants did not respond to alarms, whilst due to differences in recording methods there are no figures for comparison in the rest of the UK, the similarities in the rest of the statistics would suggest that the figures would be similar in the rest of the UK.

OPERATIONAL RELIABILITY: SMOKE ALARMS VS SPRINKLERS

Operational reliability can be considered as how reliable is the system in coming into operation when a fire breaks out.

The 2018-2019 fire statistics from England show that in 21% of dwelling fires mains powered smoke alarms failed to operate, whilst a worrying 38% of battery powered smoke alarms also failed to raise the alarm.

This is in sharp contrast with the operational reliability data for sprinklers which show that the operational reliability of sprinkler systems was 94%.

BAFSA acknowledges the huge role smoke alarms in the home have played in reducing fire deaths and casualties, but there is more to be done. The installation of sprinklers alongside working smoke alarms would further reduce the number of fire deaths in the home.

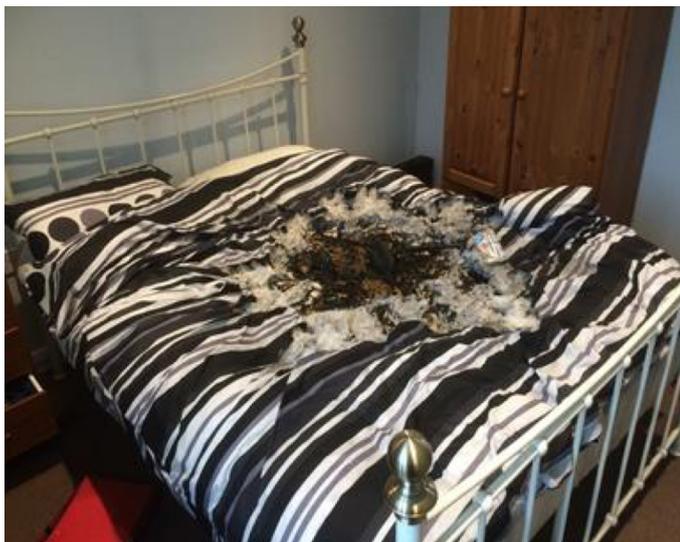


Figure 1: fire at a flat in Suffolk damage limited to bed only

SPRINKLER EFFECTIVENESS

Sprinklers control or extinguish fires in 99% of cases, in addition to the reduction in fatalities the severity of injuries where sprinklers operate is also greatly reduced, there is a significant reduction in the likelihood (22%) of people requiring hospital treatment when involved in a fire which is controlled by a sprinkler system.⁷

Whilst life safety is the primary aim of sprinkler systems in dwellings there is also a reduction in the damage caused, UK FRS data shows that in dwellings where sprinkler systems operated had an average area of fire damage of under 4m² compared to an average area of fire damage of 18 to 21m².

LEGISLATION AND SPRINKLERS IN DWELLINGS

The legislative picture regarding sprinklers in dwellings varies between countries in the UK. In Wales automatic water suppression systems (AWSS) are mandatory in all new build dwellings, in Scotland they are compulsory in dwellings which form part of a sheltered housing complex, and in high rise domestic buildings and there is forthcoming legislation which will make it a legal requirement for all future new build social housing properties to be fitted with sprinkler systems.

Changes to the Building Regulations Approved Document Part B Volume 1 (Dwellings) and Volume 2 (Buildings Other than Dwellings) in England and Northern Ireland will take effect on 26th November 2020. Sprinkler systems will now be required within buildings where the top floor level is greater than 11m which is measured from the finished floor level at the top floor of the building (not including plant areas) to the ground floor level at the lowest part of the building. Sprinklers will not be required to common areas such as stairs, corridors or landings when these are "Fire Sterile".

SPRINKLER STANDARDS

Domestic and residential sprinkler systems in the UK should be designed installed and commissioned in accordance with BS 9251:2021⁸ or with National Annex NA of BS EN 16925:2018⁹.

BAFSA recommends that installations and maintenance, should be carried out by a contractor with membership of an established third-party certification scheme.

- 1 Detailed analysis of fires attended by fire and rescue services, England, April 2018 to March 2019
- 2 Welsh Government Fire and rescue incident statistics 2018-19
- 3 Fire and Rescue Incident Statistics (Scotland) 2018-19
- 4 Detailed analysis of fires attended by fire and rescue services, England, April 2018 to March 2019
- 5 NIFRS Annual Report & Statement of Accounts 2018-19
- 6 Welsh Government Fire and rescue incident statistics 2018-19
- 7 Incidence of Deaths and Injuries in Sprinklered Buildings: A Supplementary Report March 2019
- 8 BS 9251:2021 Fire sprinkler systems for domestic and residential occupancies - Code of practice.
- 9 BS EN 16925:2018 Fixed firefighting systems - Automatic residential sprinkler systems - Design, installation, and maintenance

If you have a question or seek advice regarding automatic water-based fire suppression systems, please email the team: Ritchie.oconnell@bafsa.org.uk or joe.mcafferty@bafsa.org.uk. If they do not have an answer for you, they will know someone who has! FAQs can be found at bafsa.org.uk/sprinkler-systems/faqs/