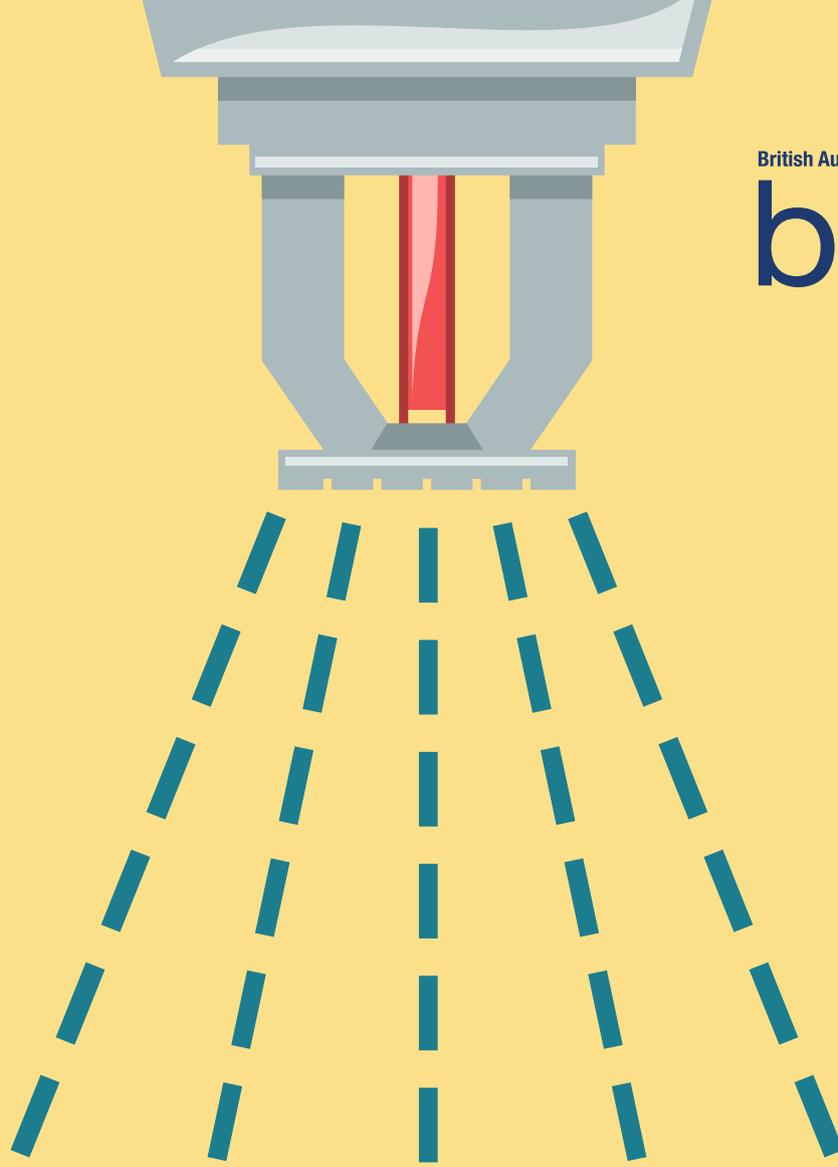


British Automatic Fire Sprinkler Association

**bafsa**



# Sprinkler Saves Review 2023–2024

## Demonstrating why sprinklers make a difference

*“We couldn’t get out. We were on the tenth floor. It was too high. I can tell you for sure that the sprinklers saved our lives.”*

lithium-ion battery fire, tall building,  
Birmingham April 2023

*“Sprinklers are not a luxury – they save lives and also reduce risk to the firefighters who have to tackle fires”*

London Fire  
Brigade spokesperson



# Put a fire-fighter in every room

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# An overview

The purpose of this review is to provide details of actual incidents that have taken place over the last year where automatic fire sprinklers have been activated.

These Sprinkler Saves, collated by BAFSA, from primary fire data and by Fire & Rescue Services around the UK, make this the only available report in the UK that demonstrates the difference automatic fire sprinklers make during a fire incident.

As such, each of these stories provides powerful evidence of the ability of sprinklers

to protect life, firefighters, and property from fire.

Note: A sprinkler save is categorised as where one or more sprinkler heads have activated and contained, controlled or in some cases, extinguished a building fire.

The review uses information collated from:

- Primary fires reported to BAFSA for the financial year ending March 2024, in which sprinklers were reported as activated and having an impact. The reported incidents

span a wide range of building types and occupancies.

- Primary fire data where Automatic Fire Suppression Systems (AFSS) were reported as activated and having an impact for 2022/2023. This was obtained following a freedom of information request to the respective teams collating fire incident data for England, Scotland, and Wales.

For this review AFSS refer to sprinkler and watermist suppression systems.

# What is Sprinkler Saves?

BAFSA's Sprinkler Saves project's main aim is to raise awareness of how the destructive effects of fire can be mitigated, and in the majority of cases, be prevented through the enhanced use of automatic fire sprinklers.

We do this by encouraging Fire & Rescue Services and our sprinkler industry colleagues across the UK to report sprinkler activations from fire incidents they have attended to our Sprinkler Saves website – [www.sprinklersaves.co.uk](http://www.sprinklersaves.co.uk) where we document each incident, including its cause, its setting and its outcome.

The details of these incidents provide vital evidence of the reliability and effectiveness of sprinkler systems and add further weight to two recent reports conducted Optimal Economics (1), and commissioned by the NFCC, NFSN into the performance, reliability, and effectiveness of sprinkler systems in controlling and extinguishing fires.

The reports found that:

- Sprinklers are 99% efficient in extinguishing or controlling a fire.
- Sprinklers are 94% efficient in their ability to operate.

*"It cannot be stressed how important active systems such as fire sprinklers are. Providing effective fire protection requires a balanced approach to the provision of both passive and active elements. The use of a combined approach plays a significant role reducing the impact of fire on people, reduce the risk to*

*firefighters, property, the environment and increase sustainability."*

The aim of the installation of a life safety Automatic Fire Suppression System (AFSS) is to reduce the rate of spread of heat and smoke, allowing more time for the occupants to escape to safety or be rescued.

The provision of a sprinkler system does not negate the need for other fire practical precautions or provisions, particularly where occupants of buildings may be at a higher-than-average risk from fire. What they do however is provide a further layer of safety from fire.

It is hoped that year on year the number of reported sprinkler saves will increase. This is due to several reasons, including changes in regulatory guidance for the installation of sprinklers in high rise residential premises reducing the building height at which sprinklers are required to 11m.

- The rise of retrofitting projects in large scale residential properties, due to the focused attention on fire safety in the aftermath of the tragic Grenfell Tower fire.
- We will stimulate growth in reporting through the:
  - i. Appointment of a designated sprinkler saves coordinator.
  - ii. Increased communication of the reporting of sprinkler activations via multiple communication channels

- iii. Publication of reports that will provide a detailed analysis of compound data on fire incidents in Great Britain where sprinklers are identified as present or activated.

This strategy will continue to promote a better understanding of the benefits of AFSS in the wider community, fire safety sector in general as an effective and reliable fire protection measure as part of a package of fire safety measures protecting life and property from fire.

Nick Coleshill  
BAFSA Sprinkler Ambassador

Nick Coleshill Coordinates the Sprinkler Saves Website for BAFSA, any questions or enquires can be submitted to [nick.coleshill@bafsa.org.uk](mailto:nick.coleshill@bafsa.org.uk)

*"Each one of the Sprinkler Saves captured in this document provides a real-world example of the power of fire sprinklers. These are tangible evidence of where sprinklers have been the difference in containing or extinguishing a fire and therefore minimising property damage, protecting the environment and protecting the lives of firefighters and members of the public. This makes me extremely proud to be associated with the fire suppression industry."*

Ali Perry, CEO BAFSA

# Monthly sprinkler incidents from April 2023 – March 2024

A sprinkler save has been chosen for each calendar month for the 12-month period ending March 2024 focusing on a variety of buildings, occupancies, types of fires. Each case study tells the story behind the sprinkler activation.

## April 2023 - Tall building, lithium-ion battery fire

*“Without the sprinklers, the family could have been very seriously injured or worse. The fire blocked their only way out. The bike battery produced a lot of smoke and fumes, which quickly spread through the flat.”*

- Occupancy: Purpose built flat 10 or more stories.
- Where: Salisbury Tower, Lady Wood Birmingham, England.
- When: 12 April 2023.
- Fire Rescue Service: West Midlands Fire & Rescue Service. (WMFRS)
- Time of call: 02:00.
- Incident: e-bike lithium-ion battery fire.
- Automatic fire suppression system (AFSS): Sprinklers.

A West Midlands mum says her partner and her young son owe their lives to a sprinkler system after it doused a fire in their high-rise home. She is quoted as saying in a West Midlands Fire & Rescue Service (WMFRS) media release: “We couldn’t get out. We were on the tenth floor. It was too high. I can tell you for sure that the sprinklers saved our lives. It is brilliant they were installed in the first place.”

WMFRS were mobilised to a fire at a residential flat on the 10th storey of a 20-storey building. Fire survival guidance was provided to the family over the telephone by Staffordshire and West Midlands fire control as smoke had begun percolating through the flat, compromising the family’s means of escape.

On arrival, operational crews established that the fire involved an electric bike that had been left on charge in the hallway of the flat and had caught alight. As a result the family were unable to evacuate and had to seek safety on their balcony.

Luckily the fire had been extinguished by the actuation of the block’s residential sprinkler system so the firefighters were able to access the building and lead the family to safety.

Simon Barry, Deputy Chief Fire Officer of WMFRS, said: “Sprinklers save lives – as this incident very clearly demonstrates. It could have ended tragically had the council-fitted system not kicked in. He added: Sprinklers are invaluable. They save lives and reduce injuries, protect firefighters who respond to fires, and reduce the amount of fire damage to property and the environment.”

“Without the sprinklers, the family could have been very seriously injured or worse. The fire blocked their only way out. The bike battery produced a lot of smoke and fumes, which quickly spread through the flat.”

Birmingham City Council should be applauded for their commitment to fire safety. In June 2017 approval was granted for 213 high rise residential block of flats to be retrofitted with fire sprinklers. Without this commitment we could be looking at a different outcome following this fire.

It should be remembered the installation of a life safety sprinkler system is to reduce the rate of heat and smoke, allowing more time for the occupants to escape to safety or be rescued.

## May 2023: Independent living kitchen fire

*“The fire had been extinguished by the actuation of one sprinkler head with fire damage contained to the extractor fan, kitchen cupboard no injuries were reported.”*

- Occupancy: Specialised housing
- Where: Brighton, England
- When: 23 May 2023
- Fire Rescue Service: East Sussex Fire and Rescue Service (ESFRS)
- Time of call: 20:58
- Incident: Kitchen fire
- AFSS: Sprinklers

ESFRS were mobilised to a kitchen fire on the fifth floor of a six-storey building involving an open-plan residential flat. Upon entry to the flat, breathing apparatus crews identified that the fire had spread from the electric hob to the overhead extractor fan due to unattended cooking. The fire had been extinguished by the actuation of one sprinkler head with fire damage contained to the extractor fan, kitchen cupboard with no injuries were reported.

This was the second reported fire for the building in the space of fourteen months. On each occasion the fire was either extinguished, contained/controlled following the activation of the sprinkler system.



May 2023 Assisted Living Kitchen Fire (Image credit: ESFRS)



June 2023 Residential care home fire tumble dryer (Image credit: Discovery Fire Sprinklers Ltd)

### June 2023 Residential care home fire

*“If this incident had taken place in England, the outcome could have been so much different.”*

- Occupancy: Care home
- Where: Dunblane, Scotland
- When: 18 June 2023
- Fire Rescue Service: Scottish Fire & Rescue Service (SFRS)
- Time of call: 20:39
- Incident: White goods appliance fire
- AFSS: Sprinklers.

The benefits of introducing statutory legislation in Scotland for the installation of sprinklers for new residential care homes was clearly demonstrated following a fire involving a tumble dryer at a care home. It was reported that the tumble dryer had overheated and caught light due to the build-up of lint. The fire activated one concealed sprinkler head which contained and controlled the fire before the arrival of SFRS.

Most of the damage was contained to the appliance itself with only minor smoke stains and a small burn mark on the vinyl flooring and minor smoke staining on the laundry room door which was closed during the fire. This is the second reported residential care home fire involving a tumble dryer fire to Sprinkler Saves UK within in 17 months. On both occasions the fire was contained and controlled by the sprinkler system to the room of origin with no injuries reported.

Unlike Scotland, where the installation of sprinklers was made mandatory for all new care homes following The Rosepark Care Home fire in South Lanarkshire in 2004, killing 14 residents, an incident like this in England could have a very negative outcome, as there is no statutory requirement for the installation of fire sprinklers for new residential care homes in England.

### July 2023: School campus fire

*“The heat and smoke from the fire activated the pendent sprinkler head which alerted crews to a further seat of fire which was contained and controlled by the sprinkler system.”*

- Occupancy: School
- Where: Dundee
- When: 2 July 2023
- Fire Rescue Service: SFRS
- Time of call: 17:34
- Incident: Arson
- AFSS: Sprinklers.

This incident reconfirms the danger of malicious acts and arson, which can have a devastating impact on both education and the community. This is identified within the ‘Impact of School Fires’ (2) publication which highlighting the direct and indirect costs associated with fires in schools, including the economic but also the educational, social and emotional effects on the local community.

In this case, unidentified youths entered the grounds of the campus and set alight combustible materials underneath an overhanging canopy. The fire spread vertically to the underside of the canopy before entering into the wall cavity as you can see from the picture below.

On arrival operational crews proceeded to extinguish the fire within the canopy and immediate vicinity. Unknown to fire crews the initial fire had compromised the brickwork at ground floor level, causing it to spall and crack next to an internal storeroom. The heat and smoke from the fire activated the pendent sprinkler head which alerted crews to a further seat of fire which was contained and controlled by the sprinkler system.

The comparison to a school fire in Yatton, Bristol, where AFSS are not mandatory, is quite stark. The fire on the 29 May 2023 led to loss of six classrooms and over 100 pupils had to

be moved to surrounding schools. Temporary classrooms so all year groups to be taught on site weren’t provided until September 2023 and the rebuild of the infant school is still in the planning stage and is expected to take at least a year to complete.

### August 2023: Recycling plant fire

*“The FRS in the UK attend around 300 significant fires in waste sites each year. These are often difficult to extinguish and require multiple resources”*

- Occupancy: Recycling Plant
- Where: London
- When: August 2, 2023
- Fire Rescue Service: London Fire Brigade (LFB)
- Time of call: 12:15
- Incident: Process production fire
- AFSS: Water mist.

LFB reported a fire involving batteries/generators in the process production room of a recycling plant that activated the premises’ water mist system which contained the fire to the room of origin.

The National Fire Chiefs Council (NFCC) says that the FRS in the UK attend around 300 significant fires in waste sites each year.(3)These are often difficult to extinguish and require multiple resources and can take a significant amount of time to bring under control. There are wider impacts that such fires create. These include: an impact on the environment due to toxic chemicals released by the fire, which in turn creates a local public health problem, large scale financial losses, impacting on jobs as well as potential impact on the local transport network.

The Waste Industry Safety and Health Forum (WISH) has published a good practice guide entitled: Reducing Fire Risk at Waste Management Sites detailing the latest research and information on achieving good fire risk management. It also includes an appendix focusing on AFSS.



July 2023 School Campus Building Fire (Image credit: Mhairi Edwards/DC Thomson)



September 2023 Tall Building Apartment Fire  
(Image credit: LFB Twitter/X)

### September 2023: Tall building apartment fire

*“They found the fire had been contained/controlled following the activation of one residential sprinkler head with minimal smoke damage reported”*

- Occupancy: Purpose-built flat of 10 or more storeys
- Where: London
- When: September 4, 2023
- Fire Rescue Service: LFB
- Incident: Kitchen Fire
- AFSS: Sprinklers.

LFB were mobilised to a fire within a residential block of flats in one of two towers of modern apartments. On arrival it was established that the fire was located within the kitchen of an apartment on the 11th floor of one of the 54-storey buildings. They found the fire had been contained/controlled following the activation of one residential sprinkler head with minimal smoke damage reported.

This reinforces the findings contained within the BAFSA publication: Fire Sprinklers, Greater London Review 2018-2021/2022, where sprinklers were recorded as being present and operated having a positive impact. The story around the incident provides powerful evidence as to the ability of AFSS in protecting our communities from fire.

### October 2023: Independent living flat fire

*“Sprinklers are not a luxury – they save lives and also reduce risk to the firefighters who have to tackle the fires.”*

- Occupancy: Specialised Housing
- Where: London
- When: October 27, 2023
- Fire Rescue Service: LFB

- Incident: Kitchen Fire
- AFSS: Sprinklers.

The alarm was raised following the activation of one concealed pendent sprinkler head following a fire within the kitchen involving cooking on the electric hob. The fire was extinguished and contained to the room of origin by the activation of the sprinkler system before the arrival of the LFB. No further firefighting was required with no injuries reported.

A London Fire Brigade spokesperson said: “The numbers of buildings in London with sprinklers systems are still very low and we would like to see this increase. Automatic Fire Suppression Systems, like sprinklers, alongside other fire safety measures can greatly reduce the impact of fires on people, property, homes, and communities.”

### November 2023: Extra care housing bedroom fire

*“It should be remembered the installation of a life safety AFSS is to reduce the rate of heat and smoke, allowing more time for the occupants to escape to safety or be rescued.”*

- Occupancy: Specialised housing
- Where: Derbyshire
- When: 24 November 2023
- Fire Rescue Service: Derbyshire Fire & Rescue Services
- Incident: Flat fire
- AFSS: Sprinklers.

The image of this incident speaks a thousand words. The fire in this specialised housing unit was contained and controlled by the activation of one sprinkler head which restricted fire damage to the bed mattress, headboard with only light smoke stains to the walls and ceilings.



October 2023 Independent Living Flat Fire  
(Image credit: DPI Sprinklers Ltd)



December 2023 School Fire  
(Image credit: MAWWFRS)

On arrival the FRS extinguished the fire using one hose reel jet. The resident self-evacuated the premises with no injuries reported. It should be remembered the installation of a life safety AFSS is to reduce the rate of heat and smoke, allowing more time for the occupants to escape to safety or be rescued.

The provision of an AFSS does not negate the need for other fire practical precautions or provisions where the person is at higher-than-average risk from fire.

### December 2023: School fire (see image above)

*“On this occasion, the impact of this school fire was minimal due to the installation of the sprinkler system which is mandatory for all centrally funded schools in Wales.”*

- Occupancy: Primary School
- Where: Wales
- When: 1 December 2023
- Fire Rescue Service: Mid & West Wales Fire & Rescue Service
- Incident: School commercial kitchen fire
- AFSS: Sprinklers.

A school commercial catering kitchen fire, involving a gas-powered cooker hob and plastic conainer was contained by the activation of the schools commercial sprinkler system, despite the seat of fire being shielded by the cooking range canopy located directly above the cooking hob.

The fire was completely extinguished by fire crews using firefighting media. No injuries were reported with 225 students and staff evacuating the premises. On this occasion, the impact of this school fire was minimal due to the installation of the sprinkler system. In Wales sprinklers are mandatory for all centrally funded schools, although this is not the case for England, despite guidance released in 2007 stating that all new schools should have fire sprinklers installed, except where they are assessed as being a low-risk.



February 2024 Tall Building Kitchen Fire (Image credit: Hampshire & Isle of Wight FRS)

### January 2024 Refuse/storeroom fire

*“This incident justifies the approach taken by Barking & Dagenham Council who made the decision in 2015/2016 to install fire sprinkler systems within all their 22 high-rise blocks waste bin chute rooms.”*

- Occupancy: Purpose-built flats/maisonettes – 10 or more storeys.
- Where: London.
- When: 16 January 2024
- Fire Rescue Service: London Fire Brigade.
- Incident: Fire in refuse/storeroom
- AFSS: Sprinklers.

The benefits of installing fire sprinkler systems within a residential block waste bin chute room, was reinforced following the activation of one sprinkler head which extinguished and contained the fire to the room of origin. On arrival operational crews were only required to dampen down and turn over the seat of the fire. These types of fires can have a dramatic effect on the safety of the residents, specifically where refuse chutes and access hatches can sometimes be found directly opening onto protected corridors, lobbies, and stairs. This can result in the spread of fire and smoke to common escape routes.

This incident justifies the approach taken by Barking & Dagenham Council who made the decision in 2015/2016 to install fire sprinkler systems within all their 22 high-rise blocks waste bin chute rooms.

This is in line with previous findings from BAFSA that highlight that refuse stores are a common area of sprinkler operation in areas outside of flats. This is unsurprising as national fire statistics in England record that for blocks flats the highest number of incidents, outside of fires in the residential areas themselves, are recorded in refuse store areas.

### February 2024 Tall building kitchen fire

*“Upon entry to the flat it was identified that the fire involving a cooking appliance had been*

*extinguished following the activation of one sidewall sprinkler head.”*

- Occupancy: Purpose-built flats/maisonettes – 10 or more storeys
- Where: Havant
- When: 19 February 2024
- Fire Rescue Service: Hampshire & Isle of Wight
- Incident: Kitchen Fire
- AFSS: Sprinklers.

The retrofitting of sprinklers within tall residential buildings as part of a package of fire safety measures provides a further layer of safety for residents from fire.

In this case fire crews were mobilised to reports of a sprinkler alarm activating in a block of flats. On arrival it was established that a fire had broken out within a third-floor flat kitchen. The activation of the sprinkler system provided time for the office in charge to complete a dynamic risk assessment and tactical fire plan.

Operational crews wearing breathing apparatus were committed. Upon entry to the flat it was identified that the fire involving a cooking appliance had been extinguished following the



March 2024 Independent Living Flat Fire (Image credit: RSP Fire Sprinklers Ltd)

activation of one sidewall sprinkler head. At the time of the fire the kitchen door was closed which contained the fire to the room of origin, limiting further fire damage.

Previous findings from BAFSA highlight that kitchen areas are a common area of sprinkler operation in within flats. This is unsurprising as national fire statistics in England show that for blocks of flats the highest number of incidents are recorded in kitchen areas.

### March 2024 Independent living flat fire

*“The elderly resident was asleep in the armchair and was alerted by the activation which prevented a fire related death or serious injury.”*

- Occupancy: Specialised housing
- Where: South Wales
- When: March 13, 2024
- Incident: Fire, living room
- AFSS: Sprinklers.

The image of the incident clearly confirms the benefits of sprinklers following a fire within an independent living complex which was successfully extinguished by the activation of one sprinkler head within a flat.

The ignition source for the fire was identified to involve a lit candle which fell on to a settee, causing it to catch light. The elderly resident who was asleep in the armchair was alerted by the activation which prevented a fire related death or serious injury. This incident clearly identifies the benefits of residential sprinklers in regards to life safety. The provision of a sprinkler system does not neglect the need for other fire practical precautions or provisions where the person is at higher-than-average risk from fire, unable to self-evacuate in the event of a fire.

**Full reports of all the above-mentioned sprinkler saves and many more can be found by visiting [www.sprinklersaves.co.uk](http://www.sprinklersaves.co.uk).**

## Reporting fire sprinkler activations to Sprinkler Saves UK

The importance of reporting a sprinkler save should not be underestimated. BAFSA wants to enhance protection against fire through the increased use of fire sprinklers by encouraging the wider acceptance and installation of fire sprinklers. BAFSA sees this by driving a culture change so that fire sprinklers are understood and accepted as the norm and not the exception in the United Kingdom.

The promotion of reported AFSS activations is dependent on the goodwill and resources of both the FRS and sprinkler industry. BAFSA actively promotes and encourages both parties to share details of AFSS activations and is supported by the NFCC, NFSN and BSA.

Usually these incidents would be recorded by the FRS with the IRS at the conclusion of the incident. However, quality of the IRS primary fire data is dependent on the fire officer who provides it. It is possible that not all fire officers are able to identify the difference between a sprinkler or water mist system or have the data on the number of sprinkler head activations before leaving the scene. For example, a balcony fire in West Hampstead, London on 3 July 2018 involved the actuation of multiple sprinkler heads, but the completed IRS data recorded the number of heads having operated as zero.

London Fire Brigade conducted a case study (4) of this incident to raise awareness in the residential sector of the benefits of AFSS in a multi-fire residential tall building and identified that within 19 minutes from time of call, five apartments were exposed to fire activating 12 sprinkler heads.

Disappointingly many FRS do not have a nominated fire officer responsible for the promotion of AFSS allowing this information to be forwarded to Sprinkler Saves UK. Whilst our sprinkler colleagues would only be aware of a sprinkler activation following a callout for one of their engineers to reinstate the system following an AFSS activation.

The result of this is that Sprinkler Saves UK is able to raise awareness of the benefits of sprinklers by being able to detail hundreds of sprinklers saves showing sprinklers as having an impact. Reporting a sprinkler save will make a difference, if you hear of a save, report it.

To submit a sprinkler save, use the designated sprinkler activation report form available to download from [www.sprinklersaves.co.uk](http://www.sprinklersaves.co.uk).

All completed sprinkler saves should be forwarded to [nick.coleshill@bafsa.org.uk](mailto:nick.coleshill@bafsa.org.uk).



**See a Sprinkler Save  
- then report it!**

# Analysis of the data captured and submitted from 70 reported fires where fire sprinklers were reported as present having an impact for 2023/2024

Types of premises	Sprinklers present, activated
Residential	47
Commercial	17
Industrial	4
Domestic	2
<b>Grand Total</b>	<b>70</b>

On average.

- 5.8 incidents reported per month.
- 1.34 incidents reported per week.

It is interesting to compare this data with the 1178 primary fires captured on the IRS where fire sprinklers were recorded as present, activated, and having an impact for the period 2018/2019 - 2022/2023 (5), equating to 236 sprinkler activations per year.

This would indicate the 70 sprinkler saves reported for the period 2023/2024 in this report represent around 30% of the fire incidents where sprinklers are recorded as operating by the FRS.

Figures collated for 2023/2024, show the reporting of sprinkler activations have increased with 70 activations compared to 57 activations for 2022/2023. An increase of 13 which can be contributed to LFB’s proactive approach reporting sprinkler activations, with 36 incidents reported compared to 13 for the previous period (2022/2023).

Of these 70 incidents, purpose-built block of flats dominated the figures in which sprinklers were reported as actuated - with 35 incidents. Again, it is interesting to compare these figures to IRS data across Great Britain for the period 2022/2023 for incidents where sprinkler operation is reported. The leading type of occupancy is once again purpose-built blocks of flats, with (111 incidents), followed by industrial premises (71 incidents). This does however indicate that industrial/factory related saves are less well reported to BAFSA.

- What the data is unable to confirm is why five incidents were recorded as unknown, further investigation of the IRS data would be required.

- The accuracy of the data cannot be confirmed until the release of official government fire data of fires attended by FRS for the period April 2023 to March 2024.

- The findings reinforce the findings of the previous Sprinkler Saves Annual Reviews, Optimal Economics reports that fire sprinklers have a good track record in reducing the impact of fire.

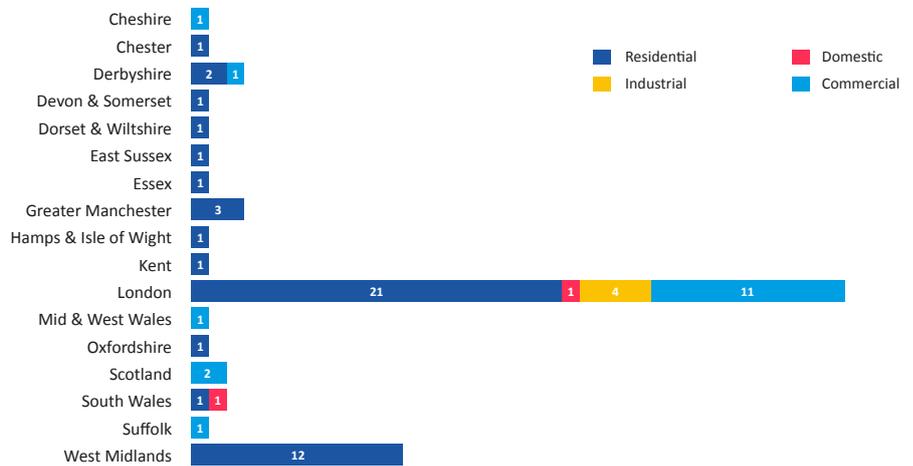


Figure 1. detailing the number of fire sprinkler activations reported where fire sprinkler systems actuated by building type and FRS.

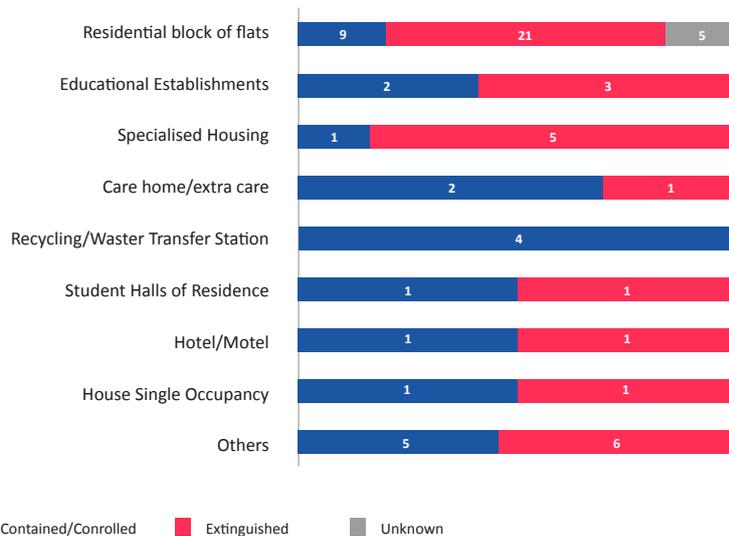


Figure 2 The effectiveness of the sprinkler system containing, controlling, or extinguishing the fire reported from 70 activations for the period 2023/2024.

# IRS Primary fire data, focusing on fires where AFSS were reported as having an impact for the financial year 2022/23

The Sprinkler Saves Annual Review 2022/2023 reported 57 AFSS actuations analysing, interrogating three key areas:

- Number of fires reported with sprinkler systems activating by building type, fire rescue service.
- Number of fires where sprinkler systems operated by individual building type.
- Effectiveness/impact of the sprinkler systems containing/controlling or even in some cases extinguishing the fire.

Fire primary data was obtained for the financial year 2022/2023 following a freedom of information request to the respective teams collating primary fire incident data for England, Scotland, and Wales.

In total 319 primary building fires were recorded where AFSS were present, operated and having an impact, of the 319 primary fires, 132 were for fires within dwellings with other buildings accounting for 187.

Types of premises	Sprinklers present, activated
Dwellings	132
Other Buildings	187
<b>Grand Total</b>	<b>319</b>

Figures are not available to confirm the number of sprinkler installations completed, or currently being undertaken across the country. However, data on fire incidents allows us to capture where sprinklers are reported and if they have activated. This provides a means to look at the trend of sprinkler incidents and by extension capture an indication of the presence of sprinkler installations in the building population.

Primary fires are split into sub-categories for the purpose of this section of the review we will be focusing on fires involving:

- Dwellings:
- Bungalow-single occupancy
  - Converted flat/maisonette-single, multiple occupancy.
  - House-single occupancy
  - Other dwelling, other
  - Purpose-built, low-rise (1-3) medium high-rise (4-9) high-rise (10+) flats/maisonettes.

Other buildings

- Agricultural premises.
- Car parks
- Communal living
- Educational premises
- Entertainment, culture, and sport
- Food and drink premises
- Hospitals and medical care
- Hotel, boarding houses, hostels, HMO, sheltered accommodation
- Industrial premises
- Offices and call centres
- Private non-residential buildings
- Other residential home/unspecified.

## Dwellings



Figure 3 Number of reported fires with AFSS activating by building type, dwellings, Fire rescue service.

It is surprising that WMFRS dominate the finding in figure 3 with 53 AFSS activations compared to LFB with 26.

This could be attributed to the decision taken by Birmingham City Council to install sprinklers in all the communal bin areas of their residential tall building property portfolio in addition to their commitment to

retrofit sprinklers in 213 high-rise housing stock in 2017.

The benefit of this decision has been reinforced for one residential block, within the space of a 10-month period as 10 refuse store/chute fires were reported which were either contained, controlled, or extinguished by the premises sprinkler system.

This will need further investigation of the primary fire data to identify a clear trend however.

When looking closely at the purpose-built block of flats section we find that unsurprisingly high-rise of 10+ more storeys dominate the figures with 83 AFSS activations. This corresponds to changes regulatory changes following the Grenfell Tower fire of 2017. Further changes to regulations in November 2020 for England have seen the threshold height for sprinklers reduced from 30m to 11m for new residential purpose-built blocks of flats.

The London Borough of Croydon was one of the first councils to retrofit fire sprinklers in their 26 high rise residential blocks over 10 stories with support and guidance from LFB.

The work was completed 2018/19. The benefits of this project were clearly identified following two separate fires in the same residential block in the space of two months in 2021. Both were controlled, contained by the installed fire sprinkler system.

Houses/bungalows accounted for only 13 operations, of which eight operations were within England, reflecting the limited statutory guidance within England for the installation of AFSS, Wales accounted for four activations.

Purpose built block of flats	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	Grand Total
1-3 Storeys	8	2	1	7	9	27
4-9 stories	7	22	9	27	19	84
10 or more stories	35	68	45	69	83	300
<b>Grand Total</b>	<b>50</b>	<b>92</b>	<b>55</b>	<b>103</b>	<b>111</b>	<b>411</b>

Table 1: Number of reported fires where sprinklers were present/operated for the period 2018/2019-2022-2023 for residential purpose-built block of flats.

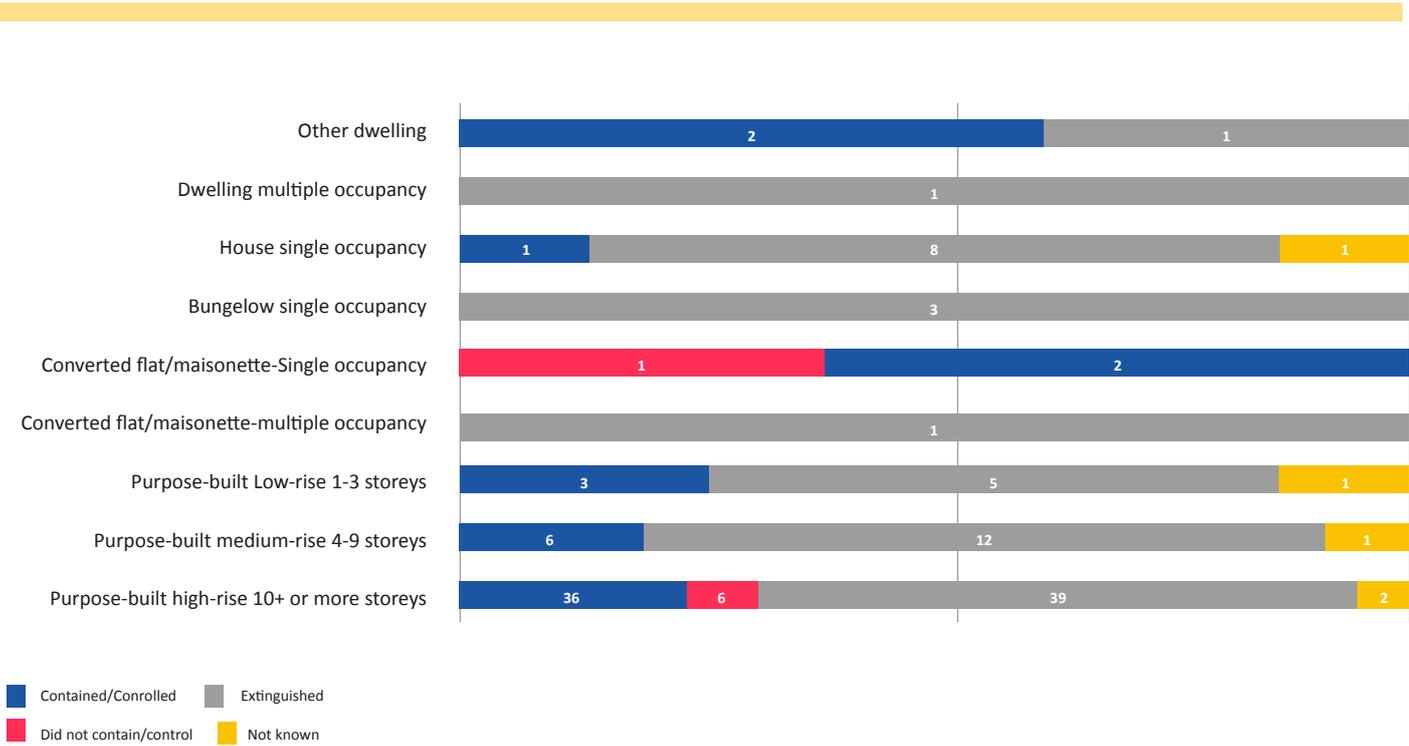


Figure 4 The effectiveness of the sprinklers system in containing the fire across the building type/dwelling.

We should expect to see an increase in the number of AFSS activations within Wales since the National Assembly for Wales passed new building regulations in October 2013 that required AFSS to be installed in all new and converted homes.

The IRS includes fields which identify the impact following the activation of sprinklers for the analysis of AFSS fires.

- Did the sprinklers; -
- i. Extinguish the fire
- ii. Contain/control the fire
- iii. Did not contain/control the fire
- iv. Not known.

From the 132 incidents recorded within the building code dwellings for the period 2022/2023 where AFSS were present/activated, the AFSS: -

- i. Contained or controlled the fire in 36% (48)
- ii. Extinguished the fire 55% (72)
- iii. Did not contain/control 5% (7)
- iv. Not known 4% (5)

What the data is unable to confirm within Figure 4 are the reasons behind why a small majority of AFSS activations did not contain/control the fire or recorded as unknown. Further investigation of the IRS data fields would be required to explore these points.

Note: preliminary examination of the incidences where AFSS are reported to have operated and did not contain/control the fire was completed. Indicated that within:

- Purpose-built high-rise 10+ or more storeys
  - i. Five were recorded as not applicable, not known or system not set up correctly.

- ii. One incident the fire was in an area not covered by system.
- iii. Converted flat/maisonette single occupancy, fault in system.

### Other buildings

Of the 187 incidents where AFSS were reported as present/operated LFB accounted for the most incidents with 33 within the Greater London area. This is no surprise as the capital of the United Kingdom, London is also the largest city with a population of just over nine million. The risk from fire in the capital is diverse, ranging from large industrial premises, complex retail shopping centres, major transport hubs, hotels, hostels.

The majority of the 187 incidents within Figure 6 were in the key primary fields.

- Industrial premises 71
- Other public buildings 55

Whilst the figures show that industrial premises account for the highest number of premises where AFSS are present/activated with 71 incidents. Within this number factories account for the highest number of activations with 25, which is surprising as sprinkler systems are not guided by regulations to be installed in factories.

In the category of 'other public buildings', it is identified prisons account for 51 of the 55 activations reported. Fires are not uncommon in prisons with the majority being located to the prison cell.

In 2009 BRE Global published a performance and specification for manual water mist suppression systems for custodial establishments which was commissioned by the Ministry of Justice in order to evaluate various fire suppression methods.

It concluded that fixed water mist systems in cells would be the preferred choice and

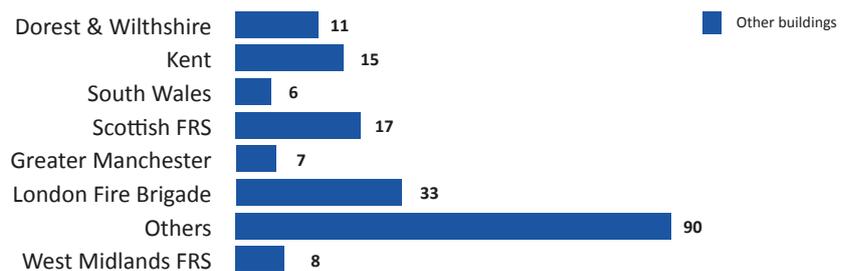


Figure 5 Primary fires where AFSS were reported as present, activated by FRS within in other buildings.

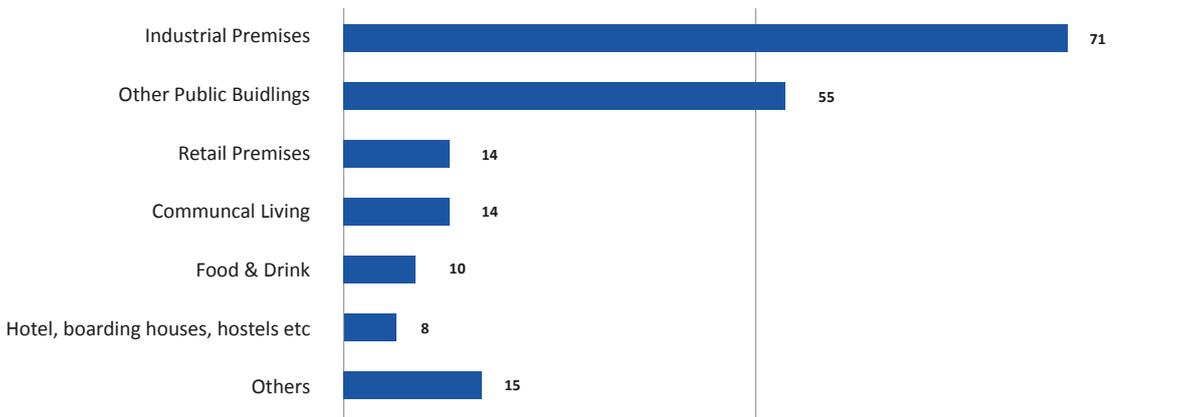


Figure 6 Number of fires where sprinklers operated by individual building type, other buildings.



Figure 7 The effectiveness of the sprinklers system in containing the fire across the building type other buildings.

mobile mist systems that introduce water mist via the inundation point in the cell door, would be used when the retrofitting of sprinklers was not considered practical. This could explain the high number of water mist activations reported with 46 of the 51 activations.

What the data is unable to confirm is the rationale behind why a small majority of AFSS fire incidents were identified as not containing/controlling the fire or recorded as unknown. Further interrogation of the IRS data fields would be required to explore this anomaly.

Note: preliminary examination of the incidences where AFSS are reported to have operated and did not contain/control the fire was completed indicated that.

- Six incidents were recorded as not applicable, null, other.
- One incident the fire was in an area not covered by system.

# Further reading/resources

BAFSA realises that primary fire incident data provides powerful evidence of the benefits of fire sprinklers publishing a series of reports, analysing IRS data on fires in sprinklered buildings from 2018-2022.

The aim of the analyses is to identify trends and gain insight into the use of sprinklers within the UK to help make the use of sprinklers the norm and not the exception.

The reports focus on a range of building types including purpose-built block of flats, educational buildings where fire sprinklers.



**#1**

**INCIDENT DATA REPORT - FOCUS ON SPRINKLERS**

This report is intended to be the first of a series of reports that will provide a detailed analysis of compound data on fire incidents in Great Britain where sprinkler systems were reported over the period of 2018/19 to 2022/23.

The aim of the analysis is to focus on identifying trends, discussion points and insights relating to the use of sprinklers within Great Britain. The outcome of which will evidence that can be used to influence change making the installation of sprinklers the norm not the exception.

**1.0 PURPOSE BUILT BLOCKS OF FLATS**

Post the Grenfell Tower fire, regulatory and sector changes relating to the safety have occurred. One such change has been the installation of sprinklers in blocks of flats across the country with housing providers, local authorities and developers committing to small numbers of purpose built blocks of flats on a new and retrofit basis.

Figures are not available to confirm the number of installations completed or currently being undertaken across the country. However, data on the incidents where it has been confirmed that sprinklers are present and if they have activated. This provides a means to look at the trend of sprinkler incidents and to examine again an indicator of presence of sprinkler installation in the building population.

This report will focus on the 102 fires recorded where sprinklers were reported as being present in the following building types:

- Purpose built low rise, 1-3 storeys
- Purpose built medium high rise, 4-9 storeys
- Purpose built high rise 10 or more storeys

HOUSING BLOCKS OF FLATS	2018/19	2019/20	2020/21	TOTAL INCIDENTS	%
1-3 storeys	16	4	5	25	7.9
4-9 storeys	17	34	17	68	21.6
10 or more storeys	52	195	79	226	70.5
Grand total				319	100

Figure 1: Primary fires attended by fire services in which sprinklers were reported

Figure 2: Number of incidents where sprinklers installed as present in the building types and historical year

Source: Fire Reports for Incident Recording System data relating to primary fires attended by FRSS in which sprinklers were present for England, Scotland, and Wales for the financial year 2018/19 to 2022/23.

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Fire sprinklers play a significant role as part of an appropriate package of fire safety measures reducing the impact of fire on people, property, and the environment.

- Sprinkler Saves UK Annual Review 2021/2022
- Sprinkler Saves UK Annual Review 2022/2023
- Fire Sprinklers Greater London Review 2018/2021

The publications focus on incidents where sprinklers were recorded as being present and operated having an impact. The fire data around the incidents provides powerful evidence as to the ability of fire sprinklers and other forms of AFSS in protecting our communities, businesses from fire.

All the above-mentioned publications are available to download from the BAFSA website, [www.bafsa.org/bafsa-publications/](http://www.bafsa.org/bafsa-publications/)

## References, sources

- 1 Efficiency and Effectiveness of Sprinkler Systems in the United Kingdom: An Analysis from Fire Service Data; May 2017
- 2 Efficiency and Effectiveness of Sprinkler Systems in the United Kingdom An Analysis from Fire Service Data-Incidence of Deaths and Injuries in Sprinklered Buildings: A Supplementary March 2019.
- 3 Impact of school fires” National Foundation for Educational Research publication
- 4 NFCC. National Operational Guidance, Fires in waste sites
- 5 West Hampstead Square, Automatic Fire Suppression System Activation case study
- 6 FOI Requests for IRS data relating to fires attended by FRSS in which sprinklers were present for England, Scotland, and Wales for the period 2018/2019 to 2022/2023.

**SPRINKLER SAVES: ANNUAL REVIEW 23/24**

Appendix A, Sprinkler Saves reported for the financial year ending March 2024

No.	Date of incident	Location	FRS	Premises type	Occupancy	Location of fire	Main source of ignition	Sprinkler system	Impact of sprinkler system	Number of heads actuated
1.	06 April 2023	Manchester	Greater Manchester	Residential block of flats	Residential	Bedroom	Smoking Materials	Wet Pipe	Extinguished	1
2.	11 April 2023	London	LFB	Residential block of flats	Residential	Kitchen	Cooking left unattended	Wet Pipe	Extinguished	1
3.	12 April 2023	Birmingham	West Midlands	Residential block of flats	Residential	Hallway	Batteries	Wet Pipe	Extinguished	1
4.	13 April 2023	Chester	Cheshire	Residential block of flats	Residential	Kitchen	Cooking	Wet Pipe	Extinguished	1
5.	16 April 2023	London	LFB	Residential block of flats	Residential	Kitchen	Cooking	Wet Pipe	Extinguished	1
6.	26 April 2023	London	LFB	Residential block of flats	Residential	Kitchen	Electrical appliance fault	Wet Pipe	Extinguished	4
7.	29 April 2023	Derby	Derbyshire	Shopping Centre	Commercial	Car Park	Motor Vehicle	Wet Pipe	Contained/controlled	Unknown
8.	03 May 2023	London	LFB	School	Commercial	Other	Fault in appliance	Wet Pipe	Extinguished	1
9.	04 May 2023	Birmingham	West Midlands	Residential block of flats	Residential	Refuse chute/bin store	Unknown	Wet Pipe	Extinguished	1
10.	11 May 2023	London	LFB	Recycling Plant	Commercial	Process/production room	Batteries/Generators	Wet Pipe	Contained/controlled	Unknown
11.	23 May 2023	Brighton	East Sussex	Residential block of flats	Residential	Kitchen	Cooking left unattended	Wet Pipe	Extinguished	1
12.	1 June 2023	Manchester	Greater Manchester	Low Rise Block of Flats	Residential	Kitchen	Cooking left unattended	Wet Pipe	Extinguished	1
13.	1 June 2023	Birmingham	West Midlands	Residential block of flats	Residential	Refuse chute/bin store	Unknown	Wet Pipe	Extinguished	1
14.	10 June 2023	Birmingham	West Midlands	Residential block of flats	Residential	Refuse chute/bin store	Unknown	Wet Pipe	Contained/controlled	1
15.	14 June 2023	Birmingham	West Midlands	Residential block of flats	Residential	Refuse chute/bin store	Unknown	Wet Pipe	Extinguished	1
16.	18 June 2023	Birmingham	West Midlands	Residential block of flats	Residential	Refuse chute/bin store	Unknown	Wet Pipe	Extinguished	1
17.	18 June 2023	Dunblane	Scottish	Care home	Commercial	Laundry Room	Electrical appliance	Wet Pipe	Contained/controlled	1
18.	19 June 2023	Birmingham	West Midlands	Residential block of flats	Residential	Refuse chute/bin store	Unknown	Wet Pipe	Extinguished	1
19.	21 June 2023	Birmingham	West Midlands	Residential block of flats	Residential	Refuse chute/bin store	Unknown	Wet Pipe	Extinguished	1
20.	25 June 2023	Birmingham	West Midlands	Residential block of flats	Residential	Kitchen	Cooking	Wet Pipe	Unknown	1
21.	25 June 2023	London	LFB	Public house/wine bar	Commercial	Kitchen	Cooking	Wet Pipe	Extinguished	Unknown
22.	2 July 2023	Birmingham	West Midlands	Residential block of flats	Residential	Refuse chute/bin store	Unknown	Wet Pipe	Unknown	1
23.	2 July 2023	Dundee	Scottish	School	Commercial	Other (external)	Heat source/combustibles brought together	Wet Pipe	Contained/controlled	1
24.	7 July 2023	London	LFB	Waste transfer station	Industrial	Refuse Store	Natural occurrence	Wet Pipe	Contained/controlled	2
25.	25 July 2023	London	LFB	Hotel	Commercial	Sauna room	Electrical wiring, cabling	Wet Pipe	Contained/controlled	1
26.	27 July 2023	London	LFB	Residential block of flats	Residential	Room	Heat source/combustibles brought together	Wet Pipe	Contained/controlled	unknown
27.	9 August 2023	London	LFB	Residential block of flats	Residential	Kitchen	Cooking left unattended	Wet Pipe	Contained/controlled	2
28.	12 August 2023	London	LFB	Recycling Pant	Industrial	Process/production room	Batteries/generators	Wet Pipe	Contained/controlled	Unknown
29.	5 September 2023	London	LFB	Food and drink processing	Industrial	Process/production room	Cooker Inc. Oven	Wet Pipe	Contained/controlled	1
30.	10 September 2023	Birmingham	West Midlands	Residential block of flats	Residential	Unknown	Cooking	Wet Pipe	Extinguished	unknown

No.	Date of incident	Location	FRS	Premises type	Occupancy	Location of fire	Main source of ignition	Sprinkler system	Impact of sprinkler system	Number of heads actuated
31.	16 September 2023	Seven Oaks	Kent	Care Home	Residential	Room	Heat source combustibles brought together	Wet Pipe	Extinguished	Unknown
32.	18 September 2023	Plymouth	Devon & Somerset	Residential block of flats	Residential	Bedroom	Heat source and combustibles brought together deliberately	Wet Pipe	Contained/controlled	2
33.	9 October 2023	London	LFB	Other bulk storage	Commercial	Unknown	Batteries, generators, Faulty fuel supplies – Electricity	Wet Pipe	Extinguished	Unknown
34.	12 October 2023	Wolverhampton	West Midlands	Supported living	Residential	Bedroom	Smoking materials	Wet Pipe	Extinguished	2
35.	12 October 2023	London	LFB	Mental health hospital	Commercial	Other	Heat source and combustibles brought together deliberately	Wet Pipe	Extinguished	1
36.	14 October 2023	London	LFB	Residential block of flats	Residential	Kitchen	Smoking materials	Wet Pipe	Extinguished	2
37.	25 October 2023	London	LFB	Recycling plant	Industrial	Paper compactor	Combustible articles too close to heat source	Wet Pipe	Contained/controlled	Unknown
38.	27 October 2023	London	LFB	Specialised Housing	Residential	Kitchen	Cooking	Wet Pipe	Extinguished	1
39.	29 October 2023	London	LFB	Specialised Housing	Residential	Kitchen	Cooking	Wet Pipe	Extinguished	1
40.	31 October 2023	London	LFB	Museum	Commercial	Refuse store/bin room	Unknown	Wet Pipe	Extinguished	3
41.	5 November 2023	London	LFB	Residential block of flats	Residential	Unknown	Electrical appliance fault	Wet Pipe	Contained/controlled	Unknown
42.	7 November 2023	London	LFB	Residential block of flats	Residential	Kitchen	Cooking – chip pan/deep fat fryer	Wet Pipe	Extinguished	1
43.	16 November 2023	Poole	Dorset & Wiltshire	Residential block of flats	Residential	Kitchen Fire	Cooking – chip pan/deep fat fryer	Wet Pipe	Unknown	1
44.	18 November 2023	South Wales Valley	South Wales	House	Domestic	Bedroom	smoking materials	Wet Pipe	Extinguished	1
45.	24 November 2023	Cheshire	Cheshire	Primary School	Commercial	boiler room	Electrical appliance fault	Wet Pipe	Extinguished	1
46.	24 November 2023	Derbyshire	Derbyshire	Extra Care	Residential	Bedroom	smoking materials	Wet Pipe	Contained/controlled	1
47.	24 November 2023	London	LFB	Residential block of flats	Residential	Private Balcony	Unsafe use of heat source - due to unsafe disposal	Wet Pipe	Contained/controlled	1
48.	24 November 2023	London	LFB	Hotel/Motel	Commercial	Bedroom	Electrical appliance fault	Wet Pipe	Extinguished	2
49.	1 December 2023	Mid & West Wales	Mid & West Wales	Primary School	Commercial	Kitchen	Combustible materials too close to heat source	Wet Pipe	Contained/controlled	1
50.	2 December 2023	London	LFB	Gym	Commercial	Cloakroom	Heat source and combustibles brought together deliberately	Wet Pipe	Extinguished	1
51.	3 December 2023	London	LFB	House	Domestic	Living room	Combustible materials too close to heat source	Wet Pipe	Contained/controlled	1
52.	4 December 2023	London	LFB	Residential block of flats	Residential	Sauna room	Combustible materials too close to heat source	Wet Pipe	Contained/controlled	3
53.	4 December 2023	London	LFB	Sheltered Housing	Residential	Kitchen	Cooker unsafe use of appliance	Wet Pipe	Contained/controlled	1
54.	6 December 2023	London	LFB	Supermarket	Commercial	Kitchen	Cooker-other cooking	Wet Pipe	Extinguished	Unknown
55.	7 December 2023	Essex	Essex	Student accommodation	Residential	Kitchen	Cooking – other cooking	Wet Pipe	Extinguished	1
56.	13 December 2023	London	LFB	Converted Flat/ Maisonettes	Residential	Bedsitting room	Heat source and combustibles brought together deliberately	Wet Pipe	Contained/controlled	1
57.	15 December 2023	London	LFB	Single shop	Commercial	Other	Unknown	Wet Pipe	Contained/controlled	1
58.	16 December 2023	London	LFB	Residential block of flats	Residential	Refuse store/ Bin room	Unknown	Wet Pipe	Contained/controlled	1
59.	17 December 2023	London	LFB	Sheltered Housing	Residential	Bedsitting room	Batteries, generators	Wet Pipe	Extinguished	1
60.	29 December 2023	London	LFB	Residential block of flats	Residential	Kitchen	Liquids; petrol/oil related,	Wet Pipe	Extinguished	1

No.	Date of incident	Location	FRS	Premises type	Occupancy	Location of fire	Main source of ignition	Sprinkler system	Impact of sprinkler system	Number of heads actuated
61.	31 December 2023	London	LFB	Residential block of flats	Residential	Kitchen	Cooking – chip pan/ deep fat fryer	Wet Pipe	Extinguished	1
62.	3 January 2024	London	LFB	Student accommodation	Residential	Laundry room	Fault in equipment or appliance	Wet Pipe	Contained/controlled	2
63.	4 January 2024	London	LFB	Residential block of flats	Residential	Bedroom	Lighted paper or card, or other naked flame, Heat source and combustibles brought together deliberately	Wet Pipe	Contained/controlled	1
64.	16 January 2024	London	LFB	Residential block of flats	Residential	Refuse store/ bin store	Cigarette, Unsafe use of heat source - due to unsafe disposal	Wet Pipe	Extinguished	1
65.	19 February 2024	Havant	Hampshire & Isle of Wight	Residential block of flats	Residential	Kitchen	Cooking-other cooking	Wet Pipe	Extinguished	1
66.	3 March 2024	Manchester	Greater Manchester	Residential block of flats	Residential	Kitchen	TBC	Wet Pipe	Contained/controlled	1
67.	12 March 2024	South Wales	South Wales	Sheltered Housing	Residential	Living Room	Candle Naked flame	Wet Pipe	Extinguished	1
68.	15 March 2024	Ipswich	Suffolk	College	Commercial	Kitchen	Self-heating	Wet Pipe	Extinguished	1
69.	18 March 2024	Derby	Derbyshire	Residential block of flats	Residential	Unknown	Unknown	Wet Pipe	Extinguished	
70.	18 March 2024	Oxford	Oxfordshire	Residential block of flats	Residential	Kitchen	Cooking	Wet Pipe	Extinguished	1

The accuracy of the data cannot be confirmed until the release of official government fire data of fires attended by FRS for the period of April 2023 to March 2024.

# Support for Sprinkler Saves UK

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**“As the use of sprinklers continues to grow in a variety of buildings we gain insights into their use and impact through incident statistics. However, the statistics do not bring the effectiveness of sprinklers to life as much as the details of individual saves that are collated in this document. These saves help to clearly link the impact of sprinklers to dramatically alter the outcome of a fire for the benefit of our communities.”**

*Tom Roche  
Secretary, Business Sprinkler Alliance*

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**“The work that BAFSA are doing in highlighting ‘Sprinkler Saves; is incredibly important as the information gained comes from real life fire situations. The reported fires involve a large range of building types, uses, fire loading and fire causation. Across the range sprinkler systems have operated and either contained or extinguished fires, providing clear evidence of the benefits of these systems in the real world environment. Through the National Fire Sprinkler Network we continue to support BAFSA by promoting the reporting of Sprinkler Saves across the Fire and Rescue sector and through our wider network partners.”**

*Terry McDermot  
Secretary, National Fire Sprinkler Network*

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**“Sprinkler Saves Review continues to support and build a catalogue of case studies and essential data, highlighting how sprinklers can and do, make a real difference in saving lives and property. Sprinklers remain a key focus for the NFCC and wider commercial community where together, we continue to raise awareness and evidence of their effectiveness in suppressing fires, limiting damage and reducing costs for businesses and protecting vital community assets. I’d like to thank Nick Coleshill for producing this Annual Review and everyone involved in its production, alongside the Fire and Rescue Services that support this through submitting case studies via the Sprinkler Saves website.”**

*CFO Jonathan Dyson  
NFCC Sprinkler Lead*

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## **About British Automatic Fire Sprinkler Association (BAFSA)**

BAFSA is the UK's leading professional trade association for the fire sprinkler industry, our primary objectives include providing authoritative information on the benefits of fire sprinkler systems and how fire sprinklers can play a significant role in saving life and property from the devastating effects of fire. To this end, BAFSA works closely with the government, FRS, building control officers, insurers, architects, and town planners.

## **Sprinkler Saves UK**

Is hosted and coordinated by BAFSA supported by the National Fire Chiefs Council, (NFCC) National Fire Sprinkler Network (NFSN) and Business Sprinkler Alliance (BSA).

British Automatic Fire Sprinkler Association

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