

Introduction

BAFSA provides a free inquiry service for both its members and the general public and each year deals with around 1000 enquiries. Many of the same questions crop up regularly and this publication is intended to provide a ready reference to some of the most 'Frequently Asked' questions.

1. Sprinkler Myths

The most commonly asked questions relate to the myths which have grown up around sprinklers.

Don't all the heads go off at once?

No, each sprinkler head is effectively a self-contained heat detector and will only operate when the predetermined temperature at which it is set to operate is reached. This is normally 68°C, so only the heads in the immediate vicinity of a fire will operate. This is also why sprinklers will not 'false alarm' - unlike smoke detectors, they will not operate if you burn the toast or let steam from your shower escape from the bathroom! Sprinkler heads only operate at their preset temperature.

Surely sprinklers create more water damage than the fire and rescue service?



Absolutely not; depending on the type and size of the premises the system is designed to protect, each sprinkler head discharges between 50 - 100 litres per minute. The discharge begins around 10 - 30 seconds after the fire produces enough heat to operate a sprinkler head. No fire brigade however efficient and effective, is likely to reach the premises involved in less than four minutes and unlikely to access the seat of the fire for at another five - ten minutes after they have been called. When fire crews get to work, they are likely to pump 1000 - 2000 litres per minute on what will inevitably have become a much larger fire. You should remember that even if you have an automatic fire detection system linked to the fire service via a central alarm station it could take up to three minutes for the call to reach your nearest fire station.

Surely sprinklers create more damage than a fire?

This is clearly nonsense when considered against the information already supplied. Which would you prefer: 50 litres per minute two minutes after the fire starts or 1000 litres per minute applied by the brigade after the fire has been burning for 20 minutes?

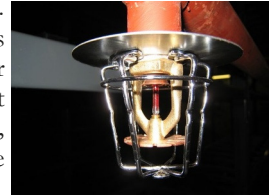


The consequences of a serious fire in an un-sprinklered supermarket. The building was rebuilt with sprinkler protection

If sprinklers false alarm, won't they create a lot of damage?

Sprinklers cannot false alarm. The only way they can operate is when the air around them reaches the head's predetermined temperature. They will not respond to smoke, dust or fumes from aerosol sprays.

It is true however, that a few heads each year are damaged by for example, the masts of fork lift trucks. Where this can happen, special protective cages should be fitted around the sprinkler head.



How do sprinkler heads work?



A sprinkler head is a temperature-controlled valve which opens, to release a spray of water, when the heat-sensitive element reaches a specific temperature. Most sprinkler heads installed within the UK are of the 'glass bulb type'. This bulb is filled with a liquid and a small bubble of vapour.

As the bulb heats to its operating temperature, the vapour expands, fracturing the bulb which allows the water in the pipework behind the head to escape. The sprinkler head operating temperature is selected to be 30°C above the highest anticipated ambient temperature. Under normal conditions, in temperate climates, a rating of 68°C or 74°C will be suitable. However, sprinkler heads with an operating temperature range from 57°C to 230°C are available as needed.

Is there not a risk of vandalism to sprinkler systems?

Sprinklers can be damaged deliberately but this is an extremely rare event and in most cases, where this happens, the vandal will get very wet and be easily identified. All sprinkler systems should be fitted with water flow alarms so that those present will be alerted to a sprinkler actuation. In many cases the waterflow alarm is connected to manned monitoring centre who will arrange for the Fire and Rescue Service to respond. There have been, to date, no known cases of sprinklers in UK schools being vandalized. *Note: that deliberate damage to any part of a sprinkler system would constitute a criminal offence.*

If there are particular concerns about risks of vandalism then special 'Institutional' sprinkler heads can be installed. These have an exposed heat collection device which will break away if struck or pulled but which will not release water. These heads were originally designed for use in prisons and mental hospitals to obviate the risk of the exposed sprinkler heads being used by inmates/residents as a method of suspending a ligature.

Is there not a risk of sprinklers causing Legionnaire's Disease?

There has been extensive research by a range of organizations including the Fire Protection Association/Loss Prevention Council to show that there is no realistic chance of a member of the public contacting *Legionella pestis* from a sprinkler system when it operates, While there may be a tiny

risk to engineering staff, this can be entirely eliminated by proper maintenance of the sprinklers.

There have been no recorded cases of Legionnaire's Disease being contracted from any fire protection system anywhere in the world.^{1 2}

Aren't sprinklers expensive to maintain?

Far from it! Unlike other fire protection systems which usually depend on electronics (which may need frequent updating or replacement) sprinkler systems need only very basic maintenance. Usually two visits each year by the installation company will suffice to keep the system in good working order. Simple weekly and monthly checks of pumps (where fitted), pressure gauges and valve settings can be carried out by a suitably trained employee.

2. Questions about sprinkler systems and protected premises

I have been told by Building Control that to obtain permission to convert my attic to a living space depends on me providing either a protected escape route or installing a sprinkler system. Can I simply protect the staircases and the route to the front door of my house?

While it would be technically possible just to protect these parts of the building this would not necessarily ensure that the escape route was always available. Most (80%) of fires in dwellings which kill people start in bedrooms or living rooms. Unless you can guarantee that the doors to these rooms are always closed it would be impossible to ensure that smoke from fires in these areas did not compromise the escape routes.

I have a fully sprinklered building, do I still really need to provide portable fire extinguishers?

While sprinklers are an extremely effective way of protecting people and property, portable fire extinguishers should still be provided so that those present who have been trained can swiftly extinguish small fires before they trigger the nearest sprinkler head.

I am installing a BS 9251 sprinkler system in a block of flats and the owners have decided that they would like the system extended to cover the car park. Can I do this?

No, BS 9251 is intended only for use in residential and domestic premises. The design density/volume of water discharged and sprinkler head coverage would not be sufficient to deal with a fire in a parked car.

The same answer would apply to an enquiry regarding the sprinkler protection of rubbish chutes and bin stores. The likely size of fires in these areas could overwhelm a BS 9251 system

How long should a sprinkler system last without major upgrading?

Most authorities agree that correctly specified and installed sprinkler systems will not need any major modification for at least 30 years and some people have said that even 40 years may be possible. It is suggested that if a building is being upgraded or modified it would be wise to test a sample of sprinkler heads in systems more than 30 years old. Should any of these fail to operate as designed then all of the heads should be replaced.

It is well known in the industry that sprinkler systems installed in the 1920s remain in good working order - often having had only minor modifications since their first installation. In January 2005, a fire in the laboratory of a paint factory in Oldham was extinguished by a sprinkler system installed, it is thought, in 1929. The system had had its water supplies upgraded in 2001 but was largely original.

I want to install sprinklers in a new building but my builder has told me that the water supply from the service mains is inadequate. What can I do?

The simplest solution is to install a water storage tank and the necessary pump/s. It may be however more cost effective to pay for a reinforced water supply - this will depend on the distance of the property from the nearest large service main. Alternatively, some water suppliers will permit the installation of a booster pump between the supply pipe and the sprinkler system.

There have been significant reductions in the maintained pressures in water service mains largely as a means of leak reduction and all water companies are wary of providing any guarantees of pressure or flow rates. Useful information on sprinklers and water supplies can be found in the publication *Guidelines for the Supply of Water to Fire Sprinkler Systems* which can be downloaded from the BAFSA website:

Does the installation of sprinklers permit trade-ups/trade-offs in respect of construction (eg. fire doors, escape routes, passive fire protection)?

Trade-offs - or trade-ups as they should be more correctly termed are often appropriate when a building is fitted with a full sprinkler system. Examples of the sort of trade-ups which might be possible include:

- Doubling compartment sizes
- Doubling travel distances to escape routes
- Reductions in fire compartment ratings
- Reductions in the number of smoke stops doors and lobbies
- Accepting non-compliance in the requirements for access by the fire and rescue service under Approved Document B5
- Allowing open plan living rooms/kitchens in dwellings
- Accepting non-compliance in the provision of means of escape for attic and loft conversions

For more information on this topic see BAFSA BIF 12: *Sprinklers and the Building Regulations*

Footnotes:

¹ LPC Rules for automatic Sprinklers Installations TB200 Legionella and fire fighting.

² Department of Children, Families and Schools: Standard Specification 8: Sprinklers in Schools: Protection from Legionella, page 223.

3. Installing and maintaining sprinkler systems

How do I become a domestic/residential sprinkler installer and what legal requirements do I have to comply with?

At the time of writing, anyone can design and/or install a domestic/residential sprinkler system. If the system is to be supplied with water from a water company service main then the supply company concerned require an installer to demonstrate their competence or have the work undertaken under the control of a Registered Plumber.

Residential and domestic systems should comply with BS 9251: 2005 *Sprinkler systems for residential and domestic occupancies - Code of practice*. This Code requires, among other things, that such systems be installed by an 'experienced sprinkler contractor' such being defined as a 'contractor who is suitably qualified and experienced and has independent documentation providing evidence of this'.

Most domestic and residential sprinkler systems presently being installed in the UK are either at the behest of an enlightened developer, aware homeowner or as a requirement of achieving alternative compliance with Approved Document B of the Building Regulations (or the equivalent in Scotland). In the latter case it is likely that the Building Control Department will require evidence of competence before granting approvals.

Can I install or maintain sprinklers without registering with anyone or being approved by the government or any other organisation?

It is a legal requirement that anyone installing or maintaining any type of fire systems required for the safety of life must be able to prove their competence. The simplest way to do this is to obtain third party certification from a UKAS³ accredited body.

Third party certification schemes are provided by both LPCB/BRE Certification and Bodycote Warrington and both schemes cater specifically for new entrants to the industry.

It is also unlikely that you will be invited to install or maintain any systems that are either mandated by the insurance companies or which are being required as a condition of Building Regulations /Scottish Building Standards approval unless you have some objective evidence of competence.

What standards do I need to comply with when designing or installing sprinkler systems?

There are a number of standards that relate to sprinklers:

a. Domestic/Residential Sprinkler Systems

BS 9251: 2005 *Sprinkler systems for residential and domestic occupancies - Code of practice*.

In addition, components for such systems should comply with:

BS DD252: 2002: *Components for residential sprinkler systems - Test methods and specifications for residential sprinklers*.⁴

b. All Other Systems

BS EN 12845:2004 *Fixed firefighting systems - Automatic sprinkler systems - Design, installation and maintenance*.⁵

There is also a full range of equipment standards for system components for systems installed to BS EN 12845 under BS EN 12259.

c. LPC Rules for Automatic Sprinklers

These are insurer's requirements and consist of BS EN 12845: 2005 together with a series of Technical Bulletins (TBs). Compliance with these Rules is invariably specified by a client/owner if the sprinkler system is being installed at the behest of the insurer or if the insurer is offering a premium discount for the presence of sprinklers. Note that when compliance with the LPC Sprinkler Rules is required all components utilised in the system must be listed by an approved international test house.

d. FM Rules

FM Global is a US-based, international insurer that issues its own sprinkler standards. You can access these from its website: www.fmglobal.com.

e. NFPA Standards

The US National Fire Protection Association issues a wide range of standards which are used extensively in the US and elsewhere. NFPA 13 is the main sprinkler standard while NFPA 13-R covers residential sprinkler systems and 13-D is for domestic properties.

f. Company Standards

Some large companies have their own sprinkler standards and installers are expected to comply with these even where they deviate from national standards

BAFSA does not supply copies of standards /documents except to its members. You can purchase copies of standards from the publishers. (See Useful Addresses below).

Where can I get training in respect of maintaining/designing/installing sprinkler systems?

A range of organisations offer such training including some BAFSA members, the Fire Protection Association, the Fire Service College, BodycoteWarrington, the UK Fire Consortium and the Mid Career College. (See Useful Addresses below). BAFSA's website lists dates for training courses offered by organizations which it has accredited. See: www.bafsa.org.uk.

Can I train one of my existing maintenance staff to undertake sprinkler system maintenance?

This can be done subject to the matter of competence mentioned above. However it would be wise to verify that any insurers with an interest in your premises were content to have this arrangement put in place. It is clear that UK fire safety legislation imposes liabilities on employers with regard to the need for proper maintenance of all fire systems installed for the protection of life.

Footnotes:

³ United Kingdom Accreditation Service - a government sponsored organisation.

⁴ Under review in 2009.

⁵ To be re-issued with minor amendments in 2009.

Even if an employee were to be fully trained to an appropriate level it would be wise to ensure that all sprinkler system components are inspected by a specialist contractor on a regular basis. Don't overlook the need to check electric and diesel pumps and water storage tanks. There is also a requirement to undertake regular checks ('the hazard review') to ensure that the fire risks in the protected premises have not changed.

Are insurance discounts available if sprinklers are installed?

This is solely a matter for individual insurance companies but it is well known that premium discounts may be available when certain types of premises are fully sprinklered in accordance with established standards. Discounts of as much as 65% of annual premiums on warehouses used for storage and distribution have been reported

In addition, some insurers may also reduce the excess figure (ie the amount of the loss the client has to pay) to a nominal amount if sprinkler protection is provided. However it is unlikely that discounts will be offered for sprinklers installed in dwellings as the fire insurance element of a domestic insurance policy is very small.

Why should I acquire third party certification when this is not legally required?

Where an installation or supplier company has submitted itself to the process of being accredited under a UKAS-approved scheme it means that the customers of that company can be assured that the services or equipment supplied will meet all appropriate standards and codes.

In the case of sprinkler installation companies, third party certification is provided either by the LPCB/BRE Certification Ltd under their LPS 1048/LPS 1301 scheme or by BodycoteWarrington under their FIRAS Scheme.

LPS 1048 applies to industrial and commercial sprinkler systems while LPS 1301 covers residential and domestic systems. There are also two FIRAS schemes, one for domestic and residential systems and the other for BS EN 12845 systems.

Listed companies have not only to comply with rigorous criteria in respect of the way they organise their design and installation work, they must also hold a Quality Assurance certification to ISO 9000.

Presented by:



Useful Names and Addresses

BSI Global
389 Chiswick High Road, London, W4 4AL
Tel: 020 8996 9000 Fax: 020 8996 7001
Web: www.bsi-global.com

European Fire Sprinkler Network
70 Upper Richmond Road
London SW15 2RP
email: info@eurosprinkler.org
Web: www.eurosprinkler.orgFM

FM Global
1 Windsor Dials, Windsor, Berks SL4 1RS
Brendan McGrath, Manager,
International Standards
Telephone: +33 1 46 93 24 22
Fax: +33 1 46 93 97 09
Email: brendan.macgrath@fmglobal.com
Web: www.fmglobal.com

Fire Protection Association
London Road, Morton in Marsh,
Gloucestershire GL56 0RH
Tel: 01608 812500 Fax: 01608 812501
Web: www.thefpa.co.uk

LPCB/BRE Certification Ltd
Bucknalls Lane, Garston,
Watford, Hertordshire WD 25 7JR
Tel: 01923 664000 Fax: 01924 664010
Web: www.brecertification.co.uk or www.bre.co.uk

Mid Career College
PO Box 20, Cambridge CB1 5DG, UK.
Tel: 01223 880016 Fax: 01223 881604
Web: www.mid-career-college.ac.uk

National Fire Protection Association
1 Batterymarch Park, PO Box 9101
Quincy, Massachusetts 02269, USA
Tel: 00 1 617 984 7445 Fax: 00 1 617 770 3000
Web: www.nfpa.org

National Fire Sprinkler Network
c/o Ronnie King, Vice Chairman
Web: www.nfsn.co.uk/

Department of Communities and Local Government
(CLG)
Fire Safety and Building Regulations
Communities and Local Government Ashdown House
123 Victoria Street London SW1E 6DE

BodycoteWarrington
Holmesfield Road, Warrington, Cheshire, WA1 2DS
Tel: 01925 655 116 Fax: 01925 655 419
Web: www.wfrc.co.uk

bafsa

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