

Introduction

BAFSA provides a free inquiry service for both its members and the general public and each year deals with around 1800 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?

I'm sure I've seen this happening on tv!

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. The depictions of sprinklers on tv and in films is invariably wrong!

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

Absolutely not: a sprinkler head discharges between 35 - 100 litres per minute (depending on the design of the system). The discharge will begin around 10 - 30 seconds after the fire produces enough heat to operate the sprinkler head. No fire brigade, however efficient and effective, is likely to reach the premises involved in less than four minutes and unlikely to get to the seat of the fire for five - ten minutes after they have been called. When fire crews get to work, they are likely to pump 1000 - 3000 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: 35 litres per minute two minutes after the fire starts or 2000 litres per minute applied by the brigade after the fire has been burning for 20 minutes?

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 that

opens, to release a spray of water, when the heat-sensitive element reaches a specific temperature. Most sprinkler heads installed today 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 liquid expands compressing the vapour, at the preset temperature, the vapour disappears and the expanding liquid fractures the bulb. This allows the release of the water in the pipework behind the head. 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 a monitoring centre which 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 despite that fact that more than 500 schools are now fitted with sprinklers. 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 specified. These have an exposed heat collection device that will break away if struck or pulled but which will not release water. These types of heads also prevent the risk of the exposed sprinkler heads being used by inmates/residents of mental hospitals or prisons 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 worldwide which shows that there is no realistic chance of a member of the public contracting Legionella pestis from a sprinkler system when it operates. While there may be a tiny, statistical possibility of a sprinkler maintenance technician contracting the disease if he is standing below a sprinkler head that he is removing. There are no recorded cases of anyone contracting Legionella from a sprinkler system anywhere in the world. Such risk as might exist for maintenance personnel can be eliminated by adherence to proper working practices. For more detailed information reference should be made to:

TB200 Legionella and fire fighting published as part of the LPC Sprinkler Rules by the Fire Protection Association. In respect of school sprinkler systems, refer to the DCFS document Standard Specification 8, Sprinklers in Schools.

Aren't sprinklers expensive to maintain?

Far from it! Unlike other fire protection systems, which usually depend on electronics that 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.

Given the information provided below on the life expectancy of a sprinkler system, it will be seen that the whole-life costs of systems is very low indeed.

2. Questions about sprinkler systems and protected premises

My local building control department has told me that permission to convert the attic of my house to a living space depends on my providing a protected means of escape or installing a sprinkler system. Do I have to protect the whole house or just the escape route?

While it would be technically possible just to protect some parts of the building this would not necessarily ensure that the escape route was always available. More than 50% of fires in dwellings that kill people start in bedrooms or living rooms and it is these areas that should be protected and not simply the staircase and hallway. 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 and have been told that I no longer need to provide portable fire extinguishers, is this correct?

While sprinklers are an extremely effective way of protecting people and property, BAFSA recommends that some portable fire extinguishers should still be provided so that those who have been trained and are present 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 owner has decided that he would like the sprinkler 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 more serious hazard of a car park requires a greater application of water through an increased design density/volume of water discharged. This system should be designed to be BS EN 12845:2009.

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 or subject to a change of use 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. There is no need to replace sprinkler heads as a matter of routine unless they are damaged or covered in paint.

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 the installer I have spoken to tells me that the water supply from the local mains is inadequate. Can I still install sprinklers?

The simplest solution in this case 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 supply¹ - 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 in many parts of the UK largely as a means of leak reduction and all water suppliers 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 at: <http://www.bafsa.org.uk/pdfs/publications/00000033.pdf>

3. Installing and maintaining sprinkler systems

I provide a range of facilities management services for a number of clients who have sprinkler-protected premises. Can I undertake the maintenance of the sprinkler systems?

There is no reason (subject to insurers' approval) why staff working for an FM company cannot be trained to undertake most routine checks on a sprinkler system. Competence is the primary requirement and this can be achieved by a combination of training and experience. However one of the tasks which must be undertaken every six months as part of a maintenance package is a 'hazard review' of the system. This is intended to ensure that the sprinkler system as installed is still fit for purpose and that the fire risks in the premises (e.g. the materials stored) have not changed. It is BAFSA's view that significant specialist training would be necessary to enable an employee to undertake hazard reviews. Significant liabilities could be incurred if these were not done properly including the possibility that an insurer would decline to pay out after a fire

I am an experienced plumber and want to set up in business as a sprinkler installer in domestic and residential properties. What formalities or registration do I have to comply with?

At the time of writing, anyone can design and/or install a sprinkler system providing that they can demonstrate their competence. If the system is to be supplied with water from a water company service main then the supply company concerned will 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 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 Scottish Building Standards). In the latter case it is likely that the building control department will require evidence of competence before granting approvals. Note that the position in Wales will change in 2012 when new regulations will require sprinklers to be installed in all domestic and residential premises. New care homes in Scotland are also required to be sprinkler protected.

¹ For example, a larger diameter water supply connection.

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

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 an UKAS accredited body.

Both LPCB/BRE Certification Ltd and FIRAS Warrington provide third party certification schemes 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 an insurance company or which are being required as a condition of building regulations approval unless you have some objective evidence of competence.

Note that BAFSA requires all of its installer members to achieve third party certification within two years of joining the association.

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 9252:2011: *Components for residential sprinkler systems - Test methods and specifications*.

b. All Other Systems

BS EN 12845:2009 *Fixed firefighting systems - Automatic sprinkler systems - Design and maintenance*.

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

c. LPC Rules for Automatic Sprinklers

These are insurer's requirements and consist of the text of BS EN 12845: 2009 together with a series of Technical Bulletins (TBs). The TB's interpret and in some cases impose requirements that exceed those of the BS EN. 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 an approved international test house must list all components utilised in the system.

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 13:2010 is the main sprinkler standard (ie equivalent to BS EN 12845) 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. It's essential in such cases that written acceptance of any deviations from the BS standards is provided by the owner.

BAFSA cannot supply copies of standards /documents. You can purchase these from the publishers. (See Useful Addresses below).

Where can I find training in the design, installation or maintenance of sprinkler systems. Does BAFSA provide this?

BAFSA does not at present offer any such training courses; it does however accredit some training providers. At present these are: FIRAS Warrington and X-act Training. A range of other organisations offers such training including the Fire Protection Association and the Fire Service College. (See 'Useful Addresses', below). BAFSA's website <http://www.bafsa.org.uk/training.php> lists dates for training courses offered by organizations which it has accredited when these are known.

As an installer, why do I need to 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 schemes or by FIRAS Warrington. 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.

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.

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

Many organisations already do this 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. All UK fire safety legislation now imposes strict liabilities on employers/property occupiers with regard to the need for proper maintenance of fire systems installed for the protection of life. It is BAFSA's views that weekly and monthly checks are within the capabilities of most maintenance personnel but that other maintenance activity (quarterly, six-monthly and annual) should be undertaken only by third party certificated installation or maintenance companies. For more information on sprinkler maintenance for industrial and commercial systems see the BAFSA Publication BIF 16B: <http://www.bafsa.org.uk/pdfs/publications/00000076.pdf>

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 on a regular basis by a specialist contractor. 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.

Note that there has recently (December 2010) been a prosecution of a fire alarm technician for failing to comply with appropriate standards and this resulted in a fine and custodial sentence.

I have recently taken over a warehouse building that is fitted with a sprinkler system. I don't need this for insurance purposes do I have to maintain it?

If the sprinkler system was originally installed for life safety purposes, a failure to maintain this in good working order would be a criminal offence under Article 17 of the Regulatory Reform (Fire

² United Kingdom Accreditation Service - a government-sponsored organisation.

Safety) Order 2005 - note that if maintenance is undertaken by a second party, that party becomes a Competent thin the meaning of the Order.

Even if the system is not mandatory you should consider carefully its value in preventing fire damage to your organisation. Reliable data shows that fires in sprinklered buildings do 80% less damage than fires in unsprinklered buildings and in many cases fires are extinguished by the operation of only one or two sprinkler heads. Sprinkler protection should be seen as a valuable adjunct to a Business Continuity Plan.

Does the installation of sprinklers permit 'trade-offs' in respect of requirements regarding escape routes and passive fire protection measures?

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 that 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 sprinklers as alternative compliance for the access requirements for access by the fire and rescue service under Approved Document B5
- Allowing open plan living rooms/kitchens in dwellings

For more information on this topic see BS 9999: 2008: *Code of practice for fire safety in the design, management and use of buildings* and BAFSA BIF 12: *Sprinklers and the Building Regulations* and BAFSA Technical Guide No 2: *Using Sprinkler Systems in Buildings and Structures: Compliance with current fire safety guidance*

If I install a sprinkler system can I expect a premium discount on my buildings insurance?

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 residential premises and dwellings, as the fire insurance element of such insurance policies is small. It's also true that many of the insurance underwriters working in the residential and domestic market may not be familiar with the high reliability and efficacy of sprinkler systems when installed by certificated installers to proper standards.

4. Miscellaneous

I am unhappy with the service received from a sprinkler installer. Can BAFSA intervene and make the installer correct a problem?

BAFSA is a trade association not a regulatory or certification body. The correct route for complaints is to the installer's certification body (either LPCB/BRE Certification or FIRAS). Should you have selected an installer who is not certificated but

is a BAFSA member, BAFSA may be able to assist you depending on the circumstances. In the first instance you should write to the Secretary General at info@bafsa.org.uk giving as much detail as you can.

Non-Compliant Fire Suppression Systems

BAFSA is often asked to provide confirmation that a system does or does not comply with the appropriate standard. We do not have a technical inspection function so cannot look at individual systems or premises - there are a number of consultants who are members of BAFSA who can undertake this work for you.

However we have recently been advised that there are a number of companies installing what are claimed to be BS 9251 compliant sprinkler systems when it is clear that this claim is not sustained by a technical examination. BAFSA have issued a statement covering such systems which include so-called 'double knock systems' and grey water systems. This can be viewed at: <http://www.bafsa.org.uk/publications/guidelines-codes-of-practice.php>

It should also be noted that notwithstanding claims from some installers water mist systems cannot be said to be compliant with BS 9251 and that any water mist system intended for the protection of a residential or domestic occupancy should instead be designed and installed to BS DD 8458:2010 Part 1: *Fixed fire protection systems – Residential and domestic watermist systems - Code of practice for design and installation*

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.org

FM Global
1 Windsor Dials, Windsor, Berks
Brendan McGrath, Manager,
International Standards
Email: brendan.macgrath@fmglobal.com
Web: www.fmglobal.com

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

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

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

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