

Non-compliant automatic fire suppression systems in residential and domestic premises

British Automatic Fire Sprinkler Association

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Since the Grenfell tragedy, BAFSA is increasingly being asked for advice on what types of sprinkler and water mist systems can be utilised in high rise social housing blocks.

Where systems are being installed for the purpose of protecting life, including systems being installed as compensatory features for building regulations compliance, strict adherence to the relevant British Standards must be achieved. This means not only that the system is designed and installed in accordance with the standards (see below) but also all the components of the system must be approved for use in fire suppression systems and where a certification scheme exists, they must be listed by an appropriate testing laboratory. Additionally, systems must be subject to a regular programme of testing and maintenance – this is a legal requirement for all fire protection systems installed for life safety purposes.

At the time of writing¹, the following standards should be used:

- Residential and domestic sprinkler systems: BS 9251:2014
- Water mist systems in residential and domestic premises: BS 8458:2015

Where the residential and domestic standards cannot be used (for example if the building includes an underground car park) then systems should be designed and installed to the following:

- Industrial and commercial sprinkler systems: BS EN 12845:2015
- Water mist systems in industrial and commercial premises: BS 8489: 2016 – Note that the systems are to be designed to Part 1 and that Part 7 covers the suitability of water mist systems in low hazard occupancies

Third Party Certification and Reliability

BAFSA's members are all committed to installing automatic fire sprinkler and water mist systems in accordance with the relevant British Standard and all its installer members are independently certificated for this purpose. It has to be understood that there is no

legal obligation to comply with this, or indeed any other standard, unless such requirement is written into law - as for example in the Technical Handbooks to the Scottish Building Standards or where a Building Control Officer or an Approved Inspector are being asked to consider alternative forms of compliance with Approved Document B of the Building Regulations 2010.

That said, it is BAFSA's opinion that only fire suppression systems designed and installed to the appropriate standard should be specified for residential and domestic premises since reliability and efficacy is a paramount issue for such occupancies.

Sprinkler Systems for Residential and Domestic Premises

As already stated, residential and domestic sprinkler systems must comply fully with all parts of BS 9251:2014: *Fire sprinkler systems for domestic and residential occupancies – Code of practice*. Sadly, there are available on the market a number of systems that purport to comply with BS 9251 or, to quote one supplier: 'provide an equivalent degree of protection'. One company offering mist systems even states that as their systems are 'not being part of the fabric of the building', 'they do not come under ISO or British Standards'. Certification as applicable to systems regulated by Codes and Standards"

Such systems may be designed to other standards - or to none - but it is BAFSA's belief that these systems are unlikely to provide the same degree of certainty of reliable operation and levels of protection as systems designed and installed in accordance with BS 9251, which has been in use for more than 10 years.

Such non-standard, non-compliant systems include 'low-cost sprinkler protection' where the sprinkler heads are fed directly from the property's internal cold-water distribution system, pre-action or 'double-knock' sprinkler systems and 'personal protection' systems fed from pressurised gas cylinders. None of these can comply with BS 9251.

It should also be noted that all sprinkler systems supplied from a direct mains connection should, in addition, comply with the Water Regulations and it is BAFSA's opinion that where such systems are

**SPRINKLERS SAVE LIVES, SAFEGUARD
PROPERTY AND INVESTMENTS,
PREVENT FIREFIGHTER DEATHS AND
PROTECT THE ENVIRONMENT**

1. Work is presently underway on European (CEN) standards for both water mist and residential and domestic sprinkler systems. If and when these documents are published, the UK will have to adopt these. However it's unlikely that BS 8458 will be withdrawn.

fed via a domestic appliance or where a WC or appliance is supplied by the sprinkler pipe network, such systems are likely to be in breach of these Regulations. Before committing to purchasing any potentially non-compliant sprinkler system it would be wise to seek the views of your water supplier

Water mist Systems for Residential and Domestic Premises

It is BAFSA's opinion, endorsed by the manufacturers of water mist system components, that water mist systems intended for use in residential and domestic systems cannot and do not comply with BS 9251.

Such systems now have their own specific design and installation standard in the form of BS 8458: 2015: *Fixed fire protection systems - Residential and domestic water mist systems: Code of practice for design and installation*. Note that claims have been made for some water mist nozzles that these have been tested to BS 9252: *Components for residential sprinkler systems - Specification and test methods for residential sprinklers*.

This is the test standard for sprinkler heads and is irrelevant for water mist systems (although at the time of writing most sprinkler heads sold in the UK are tested and approved to a US standard, UL1666).

BAFSA's concerns for all such non-compliant systems relates to fears that these lack the 130 years' experience and constant refinement of 'conventional' sprinkler systems and may fail to operate as intended and thus cause the usefulness and reliability of sprinkler systems in general to be called into question.

It is worth noting that there are two types of water mist system available in the UK; low-pressure systems which operate typically at around 10-12 bar and high-pressure systems which typically operate at more than 150 bar. For comparison, sprinkler systems operate at between 7 and 8 bar but domestic systems can work quite satisfactorily at 4 bar. Virtually all residential and domestic water mist systems will be low pressure systems as the higher pressure systems can be significantly more costly than a sprinkler system.

Unwarranted Claims

Claims that systems or equipment comply with British Standards when they do not, may amount to a breach of the Trade Descriptions Act 1968 and may also constitute an offence under the Sale of Goods and Services Acts.

As is made clear in BAFSA Technical Guidance Note No. 1, the design and installation of residential and domestic sprinkler systems, any systems that deviate in any significant way from BS 9251 must have the approval of the Authority Having Jurisdiction. It would therefore be the responsibility of the AHJ or other party specifying a system to ensure that an assessment of the proposed system is made to determine whether it will provide a level of protection equivalent to a fully compliant BS 9251 system.

Third Party Certification

The Building Regulations and Scottish Building Standards strongly advise that those procuring fire systems should select suppliers/installers who hold Third Party Certification (TPC) in respect of the relevant system standard.

There are a number of certification bodies who undertake the provision of TPC for sprinkler and water mist installers – reference can be made to BIF 20:

<https://www.bafsa.org.uk/wp-content/uploads/bsk-pdf-manager/2018/07/BIF20.pdf>

Potential Liabilities: Use of Non-Compliant Systems

Specifiers or those involved in providing guidance on the procurement of non-standard systems (including the fire and rescue services) should also be aware that, at the time of writing, no third-party certification body, such as Warrington Certification Ltd, LPCB/BRE Certification Ltd or IFCC Ltd will allow a certificate of compliance or conformity to be issued for a noncompliant system. Those who propose or support the use of systems which do not comply with an appropriate standard must accept that they may incur an assumption of liability should such a system be discovered to be unfit for the purpose for which it was installed.

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